ESSAYS ON HORSE SUBJECTS

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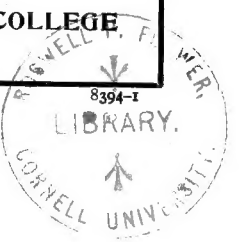

Essays On Horse Subjects

BY
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PREFACE

HAVING been requested to contribute from time to time, articles for papers devoted to the horse, I have an accumulation of these that I thought it might not be amiss to publish under the title of "Essays on Horse Subjects."

Many of these subjects I have never seen any literature upon, and these Essays are largely the result of twenty-eight years' experience as a practical horseman and veterinarian. Covering as they do the borderland between the provinces of the veterinarian and horseman, they relate to subjects which have been to a large extent neglected by both. This fact is my excuse for publishing them.

F. C. G.

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QUALITY IN HORSES

THERE is no subject upon which there seems to be more diversity of opinion amongst horsemen than as to what constitutes "quality" in a horse.

It is a term in very common use, but if you ask a number of horsemen what they mean by it you are sure to get a variety of answers. One will say it means breeding; another, conformation; another, finish; another, "class"; another, symmetry; another, individuality; another, an accentuation of all fine points; another, magnetism; another, refinement of lines or perhaps a combination of some or all of these attributes. Some say that quality is recognizable, but indefinable and unexplainable.

The term "quality" is an abstract one, indicating a special attribute in an individual, just as being well bred, well conformed and possessing finish are attributes of some individuals. When one says that a horse has "quality," one means that he has a special attribute which may or may not be combined with any or all of the

others mentioned. Of course there are varying degrees of "quality," so that the term can only be used in a comparative sense. In the light classes of horses it is very often used synonymously with breeding. Certainly the more warm-blooded a horse is the higher the degree of quality he is apt to possess, but one may take two equally well bred thoroughbreds and find one showing evidence of the possession of a higher degree of quality than the other. So that breeding and quality do not mean the same thing. Neither does quality signify the possession of symmetry, good conformation, finish or "class." A horse may be defective in any or all of these respects and still possess a high degree of "quality." He may be fiddle-headed, lop-eared, ewe-necked, sway-backed, flat-sided, slack-loined, cow-hocked and calf-kneed, and yet show much "quality."

Much confusion is caused by using the term "quality" synonymously with "class." Horses are spoken of as high-class, medium-class and so on, indicating the degree of excellence which they possess for the purpose for which they are best suited. Two individuals can be taken as an example, showing equal "quality," but one of them, on account of better conformation, more style and action, may be worth twice as much as the other. Consequently he is a higher-class individual, although the two are equal in "quality."

So that "quality" and "class" do not mean the same.

If, then, "quality" does not mean breeding or conformation or symmetry or finish or "class," or a combination of any or all of these, what does it mean? It is an easier matter to explain what constitutes "quality" than it is to give a concise and at the same time comprehensive definition of what it is. It may not inaptly be defined as *fineness in contradistinction to coarseness,* or as *fineness of texture.* How frequently one hears a prospective purchaser say to a dealer: "He is a very nice horse, but very light in bone." The dealer almost invariably replies: "Yes, but his bone is of good 'quality,'" and still further endeavors to make the statement more emphatic by saying that the bone is so dense, so compact, so ivory-like, that a cubic inch of it will weigh more than a cubic inch of some other horse that has indisputably more bone. It is a fact that the bone of some horses is much more dense or compact, and is, as the dealer expresses it, of better "quality" than that of some others.

What causes this greater density in the bones of some individuals than in those of others? We have to look to the elements of which bone is composed for the determining cause. The animal tissues are made up of fluids and solids. The solids are composed of three simple elements, viz.:

granules, fibres and cells that are only determinable by means of a microscope. This difference of quality is most easily determinable with regard to the element fibres. The fibres that form part of the tissues of an individual of high "quality" are more slender, more compact and tougher than those of one of less "quality." One can appreciate this even with the naked eye, in examining the walls of horses' hoofs. In a horse possessing a fairly high degree of "quality," the fibres which run from the coronet down, in forming the basis of the wall, are most palpably finer than in those of the wall of a coarser individual. So with the bone; the elements that combine to form it in a horse of high "quality" are finer and more highly organized than in those of a coarser individual.

What you find in regard to quality in the bones of an individual, you find pervading all the tissues of his organism. You do not find a horse with coarse bone and fine skin, or coarse skin and fine bone. If the bone is fine or has "quality," the muscles, tendons, ligaments, skin, hoofs, hair and all the other tissues which enter into his composition are equally fine or are of equal "quality." The "quality" of a horse's bone may be perfect, but undue or disproportionate length or other defective form, or faulty relationship of one bone to another, may make his conformation

very imperfect indeed, so that it is difficult to understand why some horsemen think there is any relationship between "quality" and conformation.

A high degree of "quality" is apt to be associated with defects, so that one might almost state that a horse can have too much quality. Size, or more correctly, substance, is strength, other things being equal. A horse with a high degree of quality may be so lacking in substance as to impair his power for the performance of work or for severe tests of endurance or speed. He may be so light-limbed that he cannot stand the "wear and tear" of hard work and remain practically sound. We often find horses that are superfine with disproportionately small feet, and every experienced horseman knows that it is seldom that such horses do much work and remain sound. A horse, however, cannot have too much "quality," providing it is combined with sufficient substance for the purpose for which he is required. A high degree of "quality" and sufficient substance are most important attributes in contributing to perfection in horseflesh.

There are many every-day evidences of the ill consequences of deficient quality in horseflesh. You hear a horseman say that a horse has soft legs, and he points out an individual inclined to fill about the skin of the fetlocks, to show windgalls which extend up the sheaths of his back-

tendons, and whose hocks are inclined to be puffy throughout. If he gets a bruise or injury of any kind to the skin of his legs, the consequent swelling is apt to extend and is inclined to remain. Abrasions, cuts, cracks and scratches heal rather tardily. Concussion and direct injury to bone are very much inclined to result in bony enlargement, such as splints, that spread out and have not well-defined limits. Standing in the stable too much readily produces stocking of the legs; there is a predisposition to greasy legs. The feet are inclined to be flat, large and easily bruised.

These tendencies show coarseness of tissue and low organization, a meagre blood supply and inactive nutrition. Horses with "quality" also develop windgalls and splints if subjected to sufficient cause, but their character differs from those of coarse horses in being clean-cut and well-defined and not having the tendency to spread out. A horse with "quality" may have a bog-spavin, but it will show as a well-defined prominence and not as a round puffiness of the hock throughout.

Draft horsemen talk "quality" just as much or more than those who have to do with the light breeds. The difference in the "quality" of individuals of the draft breeds is just as well marked as in the light breeds. Take for instance a Clydesdale or Shire, both of which breeds have a

considerable quantity of long hair on the back of the legs, which is often referred to as "feather." If this hair is found to be fine and silky, not coarse and wiry, you will find that it is possessed by an individual that shows "quality" throughout. His skin will not be coarse and beefy, his legs will be fluted, his bone will have a tendency to flatness, showing density of structure. The hair of his mane and tail will be fine, like that at the back of his legs. The eminences and depressions formed by the bones of his head will be comparatively finely chiseled. He, in fact, shows "quality" when compared to other members of the same breed that are equally well bred as far as possessing the characteristics of the breed, and as far as the stud book is an indication of breeding. This is a further example of the fallacy of the view that "quality" and breeding are the same thing.

HEREDITARY UNSOUNDNESS IN HORSES

THE question of hereditary unsoundness in all its aspects is by no means an open book to the horse-breeder, but it is one well worth studying by him, if as thorough a knowledge as is possible of this subject will tend to lessen the percentage of unsound stock produced. Of the various causes which tend to make horse-raising disappointing and unprofitable, this is one of the important ones, if not the most important. Literally speaking, it is not so much the inheritance of a disease itself that we fear, but it is the tendency to the development of this disease. Comparatively few foals are dropped with unsoundnesses, that impair their value ultimately, but there are many that are foaled with a predisposition to the development of unsoundness. The study of this subject, then, practically resolves itself into a consideration of what constitutes the predisposing causes of unsoundness.

They may be divided into several heads, viz: Defective formation, defective quality, and insufficient quantity of tissue and temperament.

Within certain limits, the practised eye of the observant horseman can determine in sire or dam the existence of these defects that are transmissible to the offspring, and predispose it to the development of unsoundness.

It is claimed by some authorities that some horses and mares possess a peculiar habit of body, an indefinable something about them which predisposes them and also their progeny to the development of some unsoundness. Such cases are rare, however, and their supposed existence is very frequently the result of the inability of an observer to appreciate the existence of detectible predisposing causes. If this indefinable something is the determining cause of predisposition in some cases, then the only positive evidence of its existence is the developed unsoundness. This theory presupposes that none of the detectible predisposing causes already mentioned exist in sufficient degree in such cases, so that when subjects of them are subjected to more than ordinarily exciting ones they would develop unsoundness unless the peculiar habit of body exists. It it also an acknowledgment of the helplessness of breeders in a considerable degree to prevent breeding colts with an inherent tendency to unsoundness. No matter how capable and careful a breeder is he will produce a certain percentage of unsound stock, due to heredity, but with care

it can be reduced to a small one. Many breeders use a sire from convenience or from some quality he possesses, such as speed, action, style or disposition, knowing they are taking a chance of perpetuating some tendency to unsoundness that he possesses. Favorite mares are also bred, with a disregard to the well-established principle that "like begets like," even when they are the victims of hereditary unsoundness or a strong predisposition to it. The successful breeder must divest himself of all sentiment and be capable of appreciating all defects which constitute predisposition to unsoundness. Of the predisposing causes, defective formation is the most fertile one. The predisposition to navicular disease is hereditary. Horses with narrow, deep heels are predisposed to it. Some observers may say: "But look at the large number of horses one sees with narrow, deep heels that have not got navicular disease." Of course, such an argument is fallacious, as there may be many compensating conditions that will tend to neutralize the tendency to this disease in some subjects. A horse with the formation of foot described, even although he is subjected to the exciting causes of hard, fast and steady work, and irrational and infrequent shoeing, may be endowed by nature with a very light step. Nothing tends to prevent "wear and tear" of the legs and feet like light stepping. Here, then, is an ex-

ample of an influence which tends to counterbalance the ill effects of a defective formation, but renders complicated the study of formation as a predisposing cause of unsoundness. One, then, has to weigh the influence of compensating conditions in determining the ill-consequences likely to result from defective formations of feet when transmitted to offspring. That defective formation of feet is handed down to progeny there is no manner of doubt. The predisposition to ringbone is undoubtedly hereditary, and when the pastern is of good formation one seldom finds it unless it is the result of some extraordinarily exciting cause. The two extremes of long, light oblique pasterns, and the short, straight coarse ones, are both predisposed, the former from the tension to which the ligaments are subjected, and consequent tendency to sprain, and the latter from the increased tendency to concussion. As we proceed up the front leg we find defective formation in the neighborhood of the knee, predisposing to unsoundness. Many horses that are more or less knee-sprung are practically sound. Others become progressively weak and are decidedly unsound; so that we are not much amiss in characterizing the condition called knee-sprung as an hereditary unsoundness. A commission was appointed some years ago in England to make out a list of hereditary unsound-

nesses. The list included navicular disease, ringbone, spavin, sidebone, periodic ophthalmia or moonblindness, and roaring. It will be observed that knee-sprung was not included. In order not to complicate matters they made the list as short as possible, and only included the most serious forms of unsoundness or those that are very obstinate in yielding to treatment or are incurable. Unsoundnesses such as knee-sprung, curb or splint, though the tendency to them is undoubtedly hereditary, were not included. This was because these conditions seldom permanently interfere with a horse's practical soundness. A horse is what is called "tied in" below the knee when the leg immediately below that joint is narrower from before backwards, than it is just above the fetlock. In this condition the tendons behind the knee are not well developed, and are placed too close to the shank-bone at this point. This imperfect tendonous development in a front leg is not usually confined to the tendons behind the leg, called the flexor tendons, as an imperfect development of these tendons is usually associated with an impaired development of the tendons running down the front of the leg called the extensor tendons. Such a condition frequently results in shaky knees, and if the subject experiences hard work, he is likely to become progressively worse. In some cases the flexor tendons

appear to be much better developed than the extensors, and in an individual so formed, particularly if he is inclined to stand with his forefeet well back under him, there is an inordinate strain on the extensors, leading to relaxation and a corresponding tendency to contraction of the flexors. Here we have a lack of balance between the extensors and flexors, and the result is a knee-sprung condition. Although shaky-kneed or knee-sprung horses are not frequently incapacitated for work, the breeder should not lose sight of the fact that this condition is apt to considerably depreciate a horse's value in the market, particularly for some purposes, and he can seldom afford to ignore this fact. It is not intended to advise breeders never to breed to a sire that stands a little over in the knees, especially if sufficient cause can be assigned for it, but we should recommend them to be very wary about using sires and dams that show a congenital tendency to this defect. Purchasers of horses usually look with considerable disfavor on a horse that is at all knee-sprung. Personally, the writer would rather buy a horse for his own use that is a little forward in the knees than one that stands back in them or is what is called calf-kneed. A horse with the former defect is almost sure to be much more elastic in his step than one with the latter and, consequently, will not suffer to the same ex-

tent from the ill-effects of concussion. A calf-kneed horse is also much more likely to suffer from strains. Knee-sprung, unlike the other unsoundnesses given in the list of hereditary troubles, is not very infrequently congenital. Swan-necked horses and those with thick, coarse throttles are considered to be of the formations most liable to develop the defect of the wind called "roaring." In Great Britain and Ireland and on the continent of Europe, breeders are usually very particular about avoiding roarers for breeding purposes. The climatic conditions there seem favorable to its development; but in this country it is not nearly so much to be feared, and one should not hold aloof from an otherwise desirable sire on account of his being a roarer, though it must be admitted that the predisposition to the trouble may be transmitted. The predisposition to periodic ophthalmia or moonblindness is handed down from parent to offspring, but it is not nearly so common in this country as it once was, when the sanitary conditions were not so good; and it may be that some care has been exercised in breeding, so as to avoid its propagation. The only appreciable evidence of a predisposition to this unsoundness, outside of the existence of the disease, is the small or what is called "pig eye." The writer knew a sire well that had "pig eyes" but sound ones, and they remained

sound throughout his long life, but certainly ten per cent. of his progeny developed moonblindness.

The tendency to string-halt is undoubtedly transmissible from parent to offspring. Horses with snappy hock action are most likely to develop it. Nowadays it is not feared nearly so much as it was formerly, for if it should develop, a very large percentage of cases are curable by a not very difficult and by no means dangerous operation, which consists in the cutting of a tendon. A change has taken place in the generally accepted view as to the nature of string-halt. It was considered a purely nervous malady until it was found that the cutting of a tendon would in many instances cure it.

Curb, although not, as I remember it, included in the list of hereditary unsoundnesses, is decidedly hereditary, as well as the predisposition to it. It is not an infrequent occurrence to find foals "dropped" with curbs which frequently disappear in a large measure. But there is always some trace of them remaining. It is the rarest possible occurrence to find a broad hock, and one with the tendon standing well out behind, with any sign of curb. Narrow hocks and those with the point dipped forward towards the body of the joint; a leg with small circumference immediately below the hock, or what is commonly

called tied in; those with the back tendon not standing out posterior to the bone at the back and outer part of hock—in addition to these indications of weakness and tendency to curb, if the joint is crooked, or what is called sickle-shaped, the predisposition is much increased. Curb is not so very much feared by some breeders, as it seldom causes permanent lameness. It is, however, a great eyesore; it depreciates a horse's value very considerably, and it is liable to cause recurring lameness.

Crooked hocks, unduly straight hocks, narrow hocks, small hocks, those bent inwards or outwards, are all of weak formation, and are consequently predisposed, amongst other unsoundnesses, to bone spavin. Even though a horse should happen to have a bone spavin, provided he has a strongly formed hock, it would be safer to take a chance of breeding to him than one with a sound hock but of weak formation. So far we have run over briefly most of the defective formations that predispose to serious hereditary unsoundness. We have divided the causes into four heads, the second one of which was "insufficient quantity." The old saying, "Size is strength, others things being equal," applies to a horse's extremities. We frequently hear it said that such and such a horse has "plenty of timber under him." By this is meant that the individual

in question has sufficient substance in the various structures that make up his legs and feet to give them strength and ability to stand "wear and tear."

The practical horseman of experience learns that the horse with disproportionately small feet seldom stands much work without going sore from some unsoundness of these organs. So with the slender-pasterned horse. He is not only subject to strain at that point, but predisposed to ringbone. The horse light under the knee is apt to suffer from strains of the tendons and ligaments in that situation, as well as troublesome splints. Proportionately large joints give wearing ability to the legs. This is well exemplified in the case of hocks with plenty of tissue in them. The sire that transmits small hocks to his offspring has handed down to him one of the most prolific sources of unsoundness in these joints. Defects of formation of these joints are often a cause of trouble, as has already been pointed out, but not so much so in my experience as lack of size. Stating that a horse has plenty of timber under him does not cover all cases, as some horses have plenty of tissue in their front legs and are deficient in their hind ones. In addition to formation and quantity of tissue, "quality" is of vast importance in influencing the wearing ability of the legs and feet. Parents transmit

with great faithfulness to their progeny defects in the quality of the horn of hoofs. Shelly, brittle hoofs are strongly predisposed to crack, developing sand and quarter cracks on slight provocation, and giving rise to that very troublesome inability of being unable to hold the shoes tightly. Brittle hoofs are not necessarily coarse in fibre. Hoofs of coarse fibre lack the density of structure which generally contributes to toughness. Undue size of foot, low heels and flat soles, with a tendency to be easily bruised, are apt to be associated with a lack of quality in the horn structure. A horse with bone of a spongy character or lacking in density is deficient in quality. Such an individual is predisposed to inflammatory diseases of bone, such as splints, sore shins, ringbone and spavin. The lack of quality in a horse is particularly well shown in the skin of his legs. The tendency to the development of cracked heels, stocked legs, mud fever and grease is very evident on slight provocation. Sires deficient in quality are apt to transmit to their progeny the tendency to what are called soft-legs, in which there is not only the inclination of the skin to swell up from little cause, but windgalls, puffy sheaths of tendons and boggy hocks are easily induced. If, then, we accept these statements with regard to quality, as it would appear that every practical horseman must, we must

admit that coarseness or lack of quality is by no means an unimportant factor in contributing to hereditary predisposition to unsoundness. Temperament is the last of the four heads into which we divided the predisposing causes of hereditary unsoundness. Although it must be admitted that it has an influence, we look upon it as the least important of the four. The nervous horse that jumps and gets excited on slight provocation; the anxious horse that is always up in his collar and against the bit, are more taxing on the physical mechanism than easier-going horses. We cannot afford to quite ignore this question of temperament in selecting sires and dams, but if the legs and feet are well formed, have sufficient substance, and are made up of a good quality of tissue, they will generally stand any taxing that may result from a high-strung temperament.

HITCHING IN HORSES

Of the many defects of action that horses show, one that detracts very much from the gracefulness of movement in the trot and walk is "hitching." It is a peculiar hopping movement which results from a lack of power, or from defective balance. It is said that good cooks are born, not made. Exactly the opposite is the case with "hitchers"; they are made, not born, although there is no doubt that some colts are foaled with a predisposition to "hitch." Still, even then, it may be kept in abeyance by good handling. The causes of "hitching," then, may be said to be predisposing and exciting. Of the predisposing ones the most prolific is the want of power and freedom of movement in the hindquarter. Cathammed horses, those with short hindquarters, and those that stand with their hocks too far behind them, are very liable to "hitch." Bad driving is a cause that frequently contributes to this fault. Some drivers will make almost every young horse they handle get into the habit, for it becomes almost a habit in some individuals.

Starting off at too fast a pace, urging a horse beyond his speed, particularly if he has a heavy trap behind him, and allowing him to go uncollectedly from driving with a loose rein, are causes. Drivers that allow horses to rattle along with their heads loose, particularly if they are inclined to be free, will make many hitchers, especially amongst young horses and those in which there is a predisposition to the fault.

Besides the causes already discussed and really the most important of all, is the mouth, for a very large percentage of "hitching" is referable to that organ. Horses which carry their heads steadily, hold them straight, with no crossing of jaws or opening of the mouth, and which keep their tongues in position under the bit and have responsive, firm mouths, never "hitch" when they have proper driving. Any discomfort of the mouth caused by bruises, abrasions or excoriations, making a horse sideline or bore, is very apt, in the case of a very prompt horse, to cause "hitching." On the other hand, horses that do not face the bit firmly on account of soreness of the mouth or from the bit being placed too low in the mouth or from lack of courage, or any cause that makes them go with unsteady heads, are apt to "hitch." A driver or rider with what is called bad hands is also apt to make a horse "hitch." A driver with bad hands either takes a

heavy, unyielding grip of the reins, or else holds them unsteadily, either of which causes is apt to put a horse off his balance.

The uninitiated are apt to mistake "hitching" for lameness, and it is very hard to persuade them to the contrary, especially if a horse keeps doing it persistently. It is not an unsoundness, however, for there is no lesion necessarily of the extremity "hitched." Habitual "hitching" is a fault or defect, just the same as other defects of action and "forging" are faults.

If a horse is a persistent "hitcher," however, he might almost as well be lame, as far as the unsightliness of the gait is concerned. In good hands, however, there is not much fear of it becoming habitual, and if it has become so from any cause, it can usually be remedied by good handling.

In standing about sale and show rings, we frequently hear onlookers say that such and such a horse is going lame behind, when in reality he is only "hitching." At sale and show times horses are frequently urged and pulled together to a degree very apt to put them off their balance, especially when they are called upon to keep making short turns. Some horses, even at the walk, will persistently "hitch" in being ridden in a ring when sharply bitted. Horses may be seen to drag and hop on one hind leg in going around

a ring at a walk when ridden with bit and bridoon, but if a change is made to a snaffle bit they will go squarely, thus showing how a sharp bit will cause unsteadiness and irregularity of the gait in some light-mouthed horses.

In case there is any doubt as to whether irregularity of the gait is due to lameness or to "hitching," it is easily settled by jogging the animal in question at a slow trot "in hand" without any bit in the mouth, or at most a plain snaffle, with the head loose and carried straight. It may be emphasized here that the only true test in the determination of the question as to whether a horse goes sound or not, unless the lameness is fairly pronounced, is to jog "in hand" as already explained. Horses are sometimes condemned as going lame in the show ring when it is impossible to determine with certainty whether they are lame or not until taken out of harness and run "in hand." It is sometimes a help, in deciding whether a horse is slightly sore forward or not, to get on his back, when the increased weight on the legs will intensify the tenderness.

The idea of a horse "hitching" in front is sometimes ridiculed, but occasionally one may be seen to do it unmistakably, and it is usually the result of some discomfort in connection with the mouth. As has been already said, anything that puts a horse off his balance is liable to make him "hitch."

A horse may be said to be "balanced" when every leg bears its proper proportion of weight and also exerts its share of propulsion. The position of the head is very important in regulating balance. If it is carried too low, too much weight is thrown on the fore extremities; if too high, too much strain is put on the hind ones. It is most important that the head shall be carried steadily and in proper position, for a want of firmness in its carriage is apt to put a horse off his balance and consequently lead to "hitching."

HORSESHOEING AND HORSES' HOOFS

As WITH many other subjects relating to horseflesh, there is a wide diversity of opinion as to the treatment of the horse's hoof, particularly as to that phase of it which has to do with shoeing. In New York, especially, there is a deeply rooted prejudice in favor of allowing the hoofs to grow out to very considerable proportions. If you ask some of the strong advocates of this practice their reason for it, you get the non-explanatory answer that they like to see a horse with a good foot. The question then naturally presents itself: Does a luxuriant growth of horn constitute a good foot, and is a long hoof conducive to the welfare of the foot and that portion of the extremity above it? There is no doubt you can take liberties with a horse's foot with impunity under some circumstances, but if you want a horse to do everyday work, the nearer you get a hoof to its proper dimensions the better for the foot and the leg above it. For ordinary work the hoof should be kept of such dimensions that every part of the lower surface of it shall bear

its proportionate amount of weight, and that there shall be no disturbance in the proper relations of the various parts that make up the legs and feet.

Dealers keep their horses' toes long because length of toe increases their action. A horse with long toes is bound to exert more muscular force in order to raise his feet off the ground and extend them in progression; consequently his action is increased. As they do not work their horses hard, but merely give them exercise enough to keep them well mannered to show to their customers, they do not as a rule experience the ill-results they would if they were worked fairly hard. The same remarks apply to heavy harness show horses, that are simply kept in condition to show all the style and action possible.

Everyday work, however, is another matter. The dealer and showman is right from his standpoint, but not from the standpoint of the owner who is looking for everyday service.

Too long a toe acts as a lever and very much increases the tension of the tendons and ligaments that support the fetlocks, rendering them liable to strain, and also increasing the tendency to windgalls.

Too long a toe is also a fertile cause of corns, as it increases very much the pressure on the heels and consequent liability to bruise the quick of the foot at that place, which bruise constitutes a corn.

Besides having the toes too long, the heels are allowed to grow down, taking all the pressure off the frog. Nature intended the frog to bear its proper proportion of weight, and, if it doesn't do so, it shrinks, the heels contract, and the inner quarter curls in and acts as a wedge between the shoe and the quick, and is thereby another cause of corns. Too long a hoof hastens fatigue, as the increased exertion necessary in raising and advancing the foot in progression augments the expenditure of force. The tendency to "interfere" is also much increased.

This prejudice in favor of keeping the hoofs long has been brought about and encouraged largely by the example and expressed opinions of dealers. A dealer sells a horse with long hoofs, and the purchaser sends him to the forge. The shoer, unless he has been otherwise definitely instructed, and if he understands what is best for the horse's legs and feet, will reduce the hoofs to their normal proportions. When the owner drives or rides his new purchase again, he finds the action curtailed, and thinks the horse is going sore. He applies to the seller of the horse, who tells him that he has had his feet cut away so much that it has made him sore. This might be the case in exceptional instances, but very rarely.

In addition to reduction of the hoofs in size,

the shoes may be lightened, which further lessens the action. What are called "green horses" are very apt to go sore if put abruptly into work, from the fact that their tissues have not been by degrees hardened for work; in other words, they are not in condition, and it will take some weeks before they can be safely put into anything like hard work.

After reading the foregoing, it will naturally be asked: What is the guide in determining the dimensions to which the hoof should be reduced at the time of shoeing? The practised eye of the man who understands the natural poise of the horse's leg can determine at a glance how much to reduce the hoof so that every part of the leg and foot will approximately bear its due proportion of weight. The direction of the line of weight in the extremities varies in different individuals and nature can be assisted by regulating the direction of this line in order that no part shall be unduly taxed. The horse with the straight pastern and high heel is apt to suffer from the ill-effects of concussion, while the oblique-pasterned horse is more likely to suffer from strain. The ill-consequences of these defects of formation can be neutralized in a measure by regulating the length of hoof according to circumstances. For instance, the disadvantage of long and oblique pasterns can be overcome in

a measure by keeping the hoof shortened up as much as possible, thereby reducing the tension on the supporting tissues of the fetlock. In the same way the elasticity of tread can be promoted in a straight-pasterned horse by reasonable length of toe.

Nature in some instances supplies compensations for defects of formation. In the fore extremity, the oblique shoulder, long arm and forearm and smooth flexion of the joints may in a measure counteract the injurious consequences of calf-knees and unduly short and straight pasterns. Added to this there may be that lightness of step, with which some horses are endowed, that has its determining cause in the nervous system, and which so much aids the wearing ability of the legs and feet.

Fleming, who is a justly recognized authority on horseshoeing, gives as a guide to determine the amount a horse's hoof should be reduced at the time of shoeing, that the hoof should be shortened by the rasp until it is flush with what is called the "white line." The "white line" is that portion of the hoof that forms the connecting medium between the outer margin of the sole and the inner and lower margin of the wall. Its outline is very clearly defined in a freshly rasped hoof. Fleming, doubtless, assumes that the sole and white line have not been reduced with the

knife, but have been allowed to remain, as nature intended them, of their normal thickness.

Just here it may be remarked that the practice of paring away the sole of the foot, or in other words, thinning it, is a pernicious one.

The shoer appears to like to do this, as it cuts very easily and gives, as he thinks, a "neat" appearance to the hoof. The owner appears to endorse this, as he is very careful to have his groom stop the feet, forgetting that he has permitted the shoer to remove a much more efficient stopping than any artificial one in the outer surface of the sole. This is very easy of explanation and illustration if one takes an unmutilated hoof. First of all it must be noted that the outer hard and tough crust, called the wall, grows out indefinitely, unless it is worn or broken off by contact with the ground or reduced by the instruments of the former. This is not the case with the sole, for it is so constituted that after it attains a certain thickness, by a process of nature it exfoliates of its own accord, thus maintaining its normal thickness. These outer scales that keep coming off are nature's stopping. Why? Because by protecting the inner and deeper layer from the drying effects of the air, they maintain moisture that is necessary in the sole. If, by paring, you cut through and examine a normal sole, you will find that the part next to the quick

(the part freshly secreted by the quick) is moist, and as you proceed to the surface of the sole it gradually gets dryer, the outer part being almost entirely free from moisture and admirably adapted to protect the inner and moister part until it is gradually forced outward by fresh growth from within and becomes in its turn a "stopping" for the inner and freshly formed layer of sole. What happens if the knife is used instead of nature being allowed to go on with its own process of desquamation? Why, the deeper parts of the sole become exposed to the action of the air before they are prepared for it by a gradual process of drying, and abruptly dry and contract. This is what causes the sole to become increasedly cupped, and the hoof to become contracted in a great measure. The stopping of horses' hoofs is not always necessary if the sole is left, as it should be, in an unmutilated condition, unless horses are made to stand a great deal upon dry floors. Much of the fuss and waste of time and material involved in the stopping of horses' hoofs are based on error. All that is necessary to remove the sole in a normal foot is accomplished when the rasp is flatly applied to the lower surface of the wall in reducing it to its proper dimensions. The thicker the sole the better, provided it does not project below the wall, or receive too much pressure from the shoe. One can readily

understand how much more efficient a thick sole is as a protection to the underlying quick, especially on rough, frozen and stony roads, than a comparatively thin one.

Now, if the sole is left thick, as it should be, and in which case the white line would necessarily be, it is a good guide for the shoer, in the majority of cases, to rasp down to the white line. Another error frequently made, though not so common as mutilation of the sole, is cutting away the frog. It does not require a deep student of physiology of the foot to see almost at a glance the function of the frog. Take a normal hoof and examine the frog and you will observe that it is placed at the back of the hoof, where the major portion of the pressure comes. You further find that, unlike either the sole or the wall, it is endowed with elasticity equal to india rubber. It is very evident that it is intended not only to come in contact with the ground, but also to act as a buffer in lessening concussion. Now, what happens if you cut it away and leave the heel so high that it does not come in contact with the ground? Why, it shrinks and becomes as hard as wood, entirely unsuited to stand pressure without bruising the underlying quick, and no longer capable of performing its office of breaking concussion. Not only that, but with a thin, dried-up sole, the shrunken hoof draws the

quarters with it, and you have contracted feet or at least contracted heels. After this mischief has been done through ignorance, then the horse must have that curer of all ills of the foot (according to some wise ones), spreaders, to overcome the contraction of the hoof.

Although horses are largely kept under artificial conditions, there is no reason why their hoofs should become contracted if rationally treated, unless some disease of the foot develops, such as navicular disease. Under such circumstances, the contraction is the result of disease, not the cause of it.

Another point that should be carefully watched in preparing the hoof for the reception of the shoe is to have it level. If either inside or outside of the hoof is left too long, it changes the direction of the line of weight and subjects some portion or portions of the extremity to undue strain or pressure and consequent liability to injury.

Horses that are turned out into soft fields or put into box stalls or barnyards, where there is not sufficient attrition to wear the hoof to its normal dimensions, should have it rasped down every month to its proper proportions. This particularly applies to young colts, and neglect of it is the initial step in causing hoofs of defective formation.

CORRECT ACTION IN HORSES

WHILE it is the intention of this article to endeavor to picture ideally good action, by which wear and tear and loss of power are reduced to a minimum, it is not intended to decry the possession for certain purposes, by a horse, of what is usually called high action. To render horses attractive for show and for pleasure purposes it is a highly desirable quality and very much increases their market value. The good horseman would much prefer, however, to sit behind a horse with moderate action, that raises his feet, advances them in a straight line with stride enough to insure desirable progress—yet not so much that the feet cannot be put down squarely—every part bearing its proper proportion of weight and striking the ground lightly, than one with excessive but markedly defective action. High action, like other qualities possessed in a high degree, is very apt to be associated with defects that detract from its perfection and lessen a horse's wearing quality. The ill-consequences of these defects are intensified in direct ratio to

the excessiveness of the action. The craze for high action at any cost is not so rampant as it used to be some years ago. Horse-show promoters became wearied of seeing their premiums for action carried off by acrobatic monstrosities, and it caused them to modify the wording of their prize lists and call for all-around goers with twenty-five per cent. for conformation. The horse that winds his legs about, "straddles," "points," "rolls," "spreads behind," "waddles," or drags his hind legs, is no longer in favor with the good judge, no matter how excessive his action.

The character of the action is a very important factor in determining the amount of wear and tear a horse will stand. To become a good judge of action is not such an easy matter as might be imagined. There are many who have a good eye for a horse, and, in fact, are, in a measure, good judges, who cannot intelligently criticize a horse's action from different standpoints. There are many who are taken with flashy action, which, as a rule, enhances the market value of a horse possessing it, but is very apt to be associated with greater defects from a utilitarian standpoint than that which is less attractive. In estimating the quality of action correctly in different individuals one has to have an ideal. How seldom in sitting behind a horse and closely ob-

serving his way of going at the trot and walk, do we find action that comes up to our ideal! Perfect action, as far as usefulness is concerned, is frictionless and light, and the foot is placed on the ground squarely. There is no loss of time or power in progression, or, in other words, the frictionless mover does not labor, neither does the light-stepper experience the ill-effects of concussion, which is the result of bringing the foot to the ground in a pounding manner. What a saving of wear and tear and power the smooth-mover and light-stepper experiences! One is amazed in instances to observe how much work a weak-footed, poor-legged horse will stand and still remain in workable condition. It can be accounted for in many cases by the defects mentioned being compensated for by light action.

It is interesting and instructive to study the numerous and varying conditions that conduce to defective action. Lightness of step appears to be a quality not always dependent upon the conformation of the individual. For instance, length and obliquity of the pasterns are usually said to cause lightness and elasticity of the tread, but do not always do so, for we find many heavy-going horses of this formation. Mechanically, this should conduce to light-stepping, and does in a measure, but the fact that horses with oblique pasterns sometimes pound, leads us to look for

another explanation. The statement may be advanced, in explanation, that the elasticity resulting from oblique pasterns may be neutralized by a straight shoulder; but this theory will not hold, as one not infrequently finds straight-shouldered, short-pasterned horses which step lightly. Another explanation must be found. We have to seek elsewhere in the animal economy than in the peculiar arrangement of the bones, muscles, tendons and ligaments of the limbs to account for the light step of some horses.

The endowment with this desirable quality is undoubtedly referable to the nervous system, just as speed is. We cannot determine the degree of a horse's speed by studying his external form. We have to subject him to a test, and so we have in forming a conclusion as to the degree of lightness or heaviness of his step.

With regard to labored progression, the tendency to it is usually determinable by an inspection of a horse's conformation. All deviations from the steadily carried top in the trot, in which there is no rolling, jerking or waddling, and from the straight flexion and extension of the forelegs, in which there is no straddling, dishing or winding-in, and from the equally straight and easy flexion of the hock, can, as a rule, be determined by an examination of an individual's conformation. The horse with thick or loaded shoulders

and wide chest is apt to roll; the one that stands with his forefeet placed wide apart, straddles; the knock-kneed one, as well as the one that toes-in, generally dishes, while the horse that toes-out, winds in. The horse with his hocks wide apart and feet close together, "screws" his hocks outwards and usually "plaits." When the hocks are placed behind instead of under the quarters there is likely to be a dragging movement of the hind legs. It is therefore true that faulty progression is usually determinable by conformation. Defective conformation of the legs shows itself with almost unvarying regularity in its effect upon the action. In order to have straight, undeviating action a horse must flex and extend his legs during progression in a line parallel to the long axis of the body. The knock-kneed, bow-legged, or even calf-kneed horse cannot do this, and consequently experiences the ill-results of loss of time and power in progression.

Apart altogether from the question of the degree of the lightness or heaviness of the step, the manner in which the feet are placed on the ground has a great influence in determining wear and tear, and is consequently an important point to study. The horse that toes-in usually has the inside quarter of his forefeet defectively developed, which becomes more marked if he is not rationally shod. This defect of formation of the

inner quarter consists in a slanting off of it from before backwards and outwards and from above downward and toward the centre of the foot, causing this quarter to assume a wedge-like form and literally to act as a wedge between the shoe and the sensitive part of the inner quarter, thus predisposing it to bruising. In addition to this, the horse that "dishes" usually brings his foot down with force on the inner quarter. This manner of planting the foot not only subjects the ligaments to undue tension, but is a fruitful source of troublesome corns.

On the other hand, a horse that toes-out is apt to come down with most force on the outside of his foot. This is a much more defective formation than the former, for it not only causes winding-in and great liability to interfere, but the planting of the foot is usually accomplished in a manner that results in the production of considerable concussion, and also subjects the ligaments to great tension, so that the legs soon begin to show the effects of wear and tear. Some horses come down with most force on their toes, causing them to stub their toes, as it is called. Such a manner of planting the foot is apt to cause stumbling and increases concussion to a marked extent. Short-pasterned, straight-shouldered, and short-gaited horses often show this defect.

Just the opposite manner of planting the foot

or coming down with the heel first is not at all uncommon. This defect of action is not only likely to cause bruising of the heels, but subjects the tendons and ligaments at the lower and back portion of the forelegs to excessive strain. Ordinarily this imperfection is only observed in long-gaited horses, but some that plant their feet in a favorable manner when going at a slow pace, when forced to a faster one lengthen their stride, and show this defect, often called "pointing," to a pronounced degree. Deep and oblique-shouldered horses with little knee action, like thoroughbreds, often go in this way, but its ill-effects are not so great as in those with a considerable amount of knee action.

"Threading" or "plaiting" are terms used to designate the swinging of the elevated foot around the one that is placed on the ground in progression. This ungraceful manner of going, which occasions a loss of power, is most clearly shown in the walk or slow trot.

FORGING, OVER-REACHING AND CLICKING

This Paper Won the Prize Given by *The American Veterinary Review* for the Best Essay on This Subject

THAT very disagreeable and annoying fault of striking the forefeet with the hind ones during progression, variously referred to as "clicking," "over-reaching" and "forging," is one to which some horses are predisposed; but it is excited by a number of conditions which can, as a rule, be remedied by rational treatment, even in some instances where there is a predisposition. Forging is the result of any cause that prevents a horse from getting his forefeet out of the way of his hind ones, in progression.

Undue shortness of body is a frequent predisposing cause, but one must not fall into the error frequently made of assuming that a short-backed horse is necessarily a short-bodied one. A horse may have a short back but long quarters, causing him to stand over a lot of ground or be what is called "long underneath," and be anything but short-bodied, and in fact possessing the ideal

formation, as far as this point is concerned, and be anything but inclined to forge. Horses with the fore pasterns disproportionately long, when compared to the hind ones, especially if the fore-feet are also inclined to unusual length, experience retardation in the flexion and extension of the forelegs, to a degree that renders interference from the hind ones liable.

An important factor in good action is the straight advancing of the forelegs in progression. Any deviation from this, as in wind-out or winding-in, or a combination of these two defects, sometimes called "wiggling," retards sufficiently prompt action of the forelegs to enable the feet to make way for the hind ones. These defects of action are the result of the fact that the bones that make up the foundation of the legs are defectively related to one another in forming the joints. There are very palpable illustrations of these defects of formation in horses with "knock-knees," calf-knees, turned-in or turned-out pasterns. We notice in individuals a lack of harmony in formation between the fore and hind extremities. For instance, some horses have the pasterns of the hind extremities of a length disproportionate to those of the fore, and vice-versa. So with action: some have quick and extensive flexion of the hock, out of proportion to the degree of prompt-

ness of flexion and extension of the forelegs. Such horses are liable to forge. Those that stand lower at the withers than they do at the highest point of the croup are also liable to this fault, as are also low-headed horses, particularly if they are of a sluggish temperament, as they not only lack "snap" in their action, but the lowness forward interferes with the freedom of the forward action.

In addition to the predisposing causes of forging there are a number of exciting ones, and horses that cannot be said to be predisposed may be found to forge under certain circumstances. Perhaps the exciting cause most frequently in operation is the lack of strength or condition. Many young horses forge for a time, or until they have been fed and worked sufficiently to establish nervous force and proper muscular development, so that they have perfect control of their legs.

Horses that are not in good condition may go a mile or two without "clicking," but as soon as they become fatigued or winded, begin to forge. They are particularly apt to do this if driven or ridden fast at first, and the more so if the weight they are drawing or carrying is excessive for the pace at which they are traveling.

Horses that are called upon to carry a rider—not being used to it—may temporarily show this

fault, particularly if the footing is soft or going heavy.

Those used to the hard footing and light draft of the pavement in cities may never be heard to forge until driven on a country road where the draft is greater and the going heavier.

The mouth, too, is not without an exciting influence. The horse that has a hard, unyielding, unresponsive mouth is much more liable to forge than one that, at a touch of the whip or spur, will raise his head, get his nose in, and respond to the pressure of the bit, so as to go in a balanced manner.

Indifferent riders and drivers that have bad hands, and do not know how to keep their horses collected, will allow many to over-reach.

One need never be discouraged about a young well proportioned horse, but should wait until the mouth is made, the animal got into good condition by steady judicious work, good feeding and grooming.

In horses inclined to "click," the forefeet should be kept as short as possible, and the shoes for them should be as light as can be used in order to conserve their normal condition. Very frequently horse owners use an increased weight of shoe on forefeet as a remedy for this fault, which is a palpable error, as undue weight is one of the exciting causes. Rounding off the toes of

the front shoes has a tendency to enable a horse to raise his feet from the ground more quickly, and is an aid. It is well, however, not to resort to artificial measures more than necessary. It is best, in fact, to keep the feet in as natural a condition as the circumstances of the case will permit. But in order to overcome forging in some horses, either as a temporary or permanent expedient, the principle to pursue is to encourage slow or dwelling movement of the hind feet, in order to allow the fore ones to get out of their way.

The most effectual way of doing this is to raise the toes of the hind feet and lower the heels. The toes can be raised either by thickening the shoe at the toe or putting on a toe piece. Allowing the toes of the hind hoofs to grow long is an aid, and gives opportunity for setting the shoes back, so as to do away with or lessen the noise of "clicking."

"Forging" is not an unsoundness, but it is a defect or fault, as bad action is.

INTERFERING, STRIKING, CUTTING OR BRUSHING IN HORSES

Of the many faults, accidents or habits to which horseflesh is heir, "interfering" is one of the most troublesome. Fortunately, however, it is one that admits of a large measure of prevention, and the ill-effects of it can, to a very considerable extent, be overcome. In the consideration of this subject, one of the most important points to thoroughly study is the causes. Of the somewhat numerous influences which contribute to this fault, defective conformation is a very important one in predisposing to it. It is important from the fact that cases that are largely the result of defective formation are the most difficult to successfully cope with. A horse of perfect formation of limbs should raise, advance and put down his feet approximately in a straight line in the walk or trot. Any deviation inwards from the straight line renders him liable to strike if any exciting cause is brought into operation.

Narrow horses, particularly if they are leggy, are apt to go close both behind and in front, and

consequently to "brush." Those that "toe-out" either in the hind or fore extremities, usually wind inwards in progression, and are consequently apt to interfere. In fact, there is no formation of limb that so strongly predisposes to this fault, in its most aggravated form, as the defect just mentioned. Horses as a rule that "toe-in" in the fore limbs, wind outwards, and consequently show no disposition to "brush." In such cases the "turning-in" of the toes is due to the position in which the leg is fixed on to the body. It is due to the back part of the leg showing a tendency to turn outwards from the body. This can be most clearly observed at the elbow, where the point inclines outwards. "Toeing-in," however, is not always the result of a malposition of the limb throughout, for sometimes the deformity is confined to that portion of it from the fetlock down, constituting what might be called a "club-foot." This formation often predisposes to "striking" to a marked degree, as in progression the foot comes very close to the opposite limb. In spite of the predisposition many horses show to interfering, from defective formation, such horses may be seen working month after month without inflicting any injury to themselves.

Horses that are in good condition, well balanced in going, and that have complete power of co-ordinating the movements of their limbs,

are the ones that are likely to escape the not infrequent consequences of defective formation of limb. The exciting causes of interfering are numerous, but the one most frequently heard spoken of is defective shoeing, and it is no doubt sometimes a cause, but not nearly so frequently as is sometimes supposed. The unfortunate shoer is frequently maligned for what is no fault of his. It does not matter how some horses are shod, or whether they are shod or not, they will interfere under some circumstances.

The best that we can do in the way of shoeing is to use a good, rational shoe, properly applied on a suitably prepared foot. Too heavy a shoe will sometimes act as a cause from the excessive weight taxing the muscular control of the limb unduly, so that during quick movements and sharp turns, "striking" is particularly apt to occur. Leaving the hoofs too large is sometimes a cause, from the simple consequence of its bringing the hoof closer to the opposite leg. Not only that, but the increased length of toe resulting from too large a hoof intensifies the tendency to winding either in or out in progression, and consequently increases the tendency to "cut."

The first step, then, in the attempt to prevent striking, is to reduce the wall to reasonable dimensions with the rasp. Defects of the form and direction of hoof may sometimes be remedied in

a measure; as, for instance, in a horse that "toes-out," shorten the outer part of the toe to a greater extent than the inner. The tendency of this is not only to correct the unsightliness of the deformity, but also to remedy its ill-consequence in progression. The same may be done, but just in the opposite way, in horses which "toe-in." In the hind legs it is generally the inner part of the toe of the hoof that inflicts the injury. This can be rasped so as to reduce its convex form to an approach to a straight line with the rasp, which lessens somewhat the danger. The shoe should be of reasonable weight, strong enough to keep it from breaking, and set in as much as possible on the inside without running too much risk of bruising the sole. Have the inside branch of the shoe narrow and rounded, so that there will be as little danger of inflicting injury as possible. The nails may also be withheld from the inside of the toe, so that no injury may be done from the clinches. It is a good plan to also shorten the inside of the hoof more than the outside and compensate for this by deepening the inside branch of the shoe, so as to keep the foot level and have even bearing. The inside branch of the shoe may be made almost straight from the toe back, and the hoof made to correspond pretty much in form. The following out of this plan of

shoeing will minimize the likelihood of injury being done by striking.

The weighting of the shoe on the outside is often recommended by having the outer branch considerably heavier than the inner one, with the idea that the weight on the outside makes a horse go wider. This would, no doubt, be the tendency, and provided it does not increase the weight of the shoe too much, there is no objection to it.

Another plan sometimes followed is to raise the inside of the foot higher than the outside, with the idea that the fetlock of the leg on the ground will be thrown outwards, and thus be more likely to escape injury from the opposite foot. This plan is irrational, from the fact that it causes a horse to tread unevenly, and thus tends to result in injury to some other part of the leg, disturbing the relations of the various parts that make up the weight-bearing column.

In the front legs a three-quarter shoe is sometimes used, the shoe only coming half way round on the inside, and not covering the ground surface of the inner quarter. The difficulty about this plan is getting the shoe so applied that all the wall will bear its normal amount of weight. It doesn't do to leave the inner quarter unsupported, for in that case there will be tilting of the leg inwards when the foot is put on the

ground, or, in other words, uneven treading, with the ill-consequences already explained.

Charlier shoes sometimes do very well and are much safer than a three-quarter shoe. This is a light, narrow-webbed shoe, that only comes half way round on either side of the hoof and is sunken into a groove cut out of the plantar surface of the wall, so that the lower surface of it is just flush with the quarters that are not grooved out. By this plan there is an even bearing all round the hoof, a light shoe, and one no more likely to cause injury to the opposite leg than the natural unshod hoof. The drawback about this shoe for general use on hard roads is that it has not strength enough to form a substantial stay to the hoof. It also lessens the action, and horses are apt to go sore with them on very hard roads.

It is questionable if we have a much better device for shoeing interfering horses than the rubber pads now so generally in use in cities. Their use has a tendency to prevent interfering by virtue of their effect in preventing slipping, which is one of the exciting causes of this trouble. In the hind legs, where "cutting" is most usual, the inner and back part of the fetlock is the common seat of injury. Occasionally in horses with a good deal of hock action, they will strike the

leg higher up, and in very low, close-going horses the inside of the coronet is scraped.

In the front legs the injury may be anywhere from the fetlock to the knee. When it is high up it generally gets the designation of speedy-cut. Another cause of "striking" is fatigue. It has already been pointed out that when a horse has not perfect control of his legs he is apt to "brush," so that horses that have not had regular work and good feed for a length of time, or, in other words, are not in good condition, are easily fatigued and consequently liable to interfere.

The uneven footing of rough roads, slippery roads or pavements, the swaying of a two-wheeler, are all circumstances likely to interfere with a horse's equilibrium, and consequently are not infrequently exciting causes of "striking."

Another very fertile exciting cause, particularly in cities, and one which, strange to say, is never referred to in print, is the influence of discomfort in connection with the mouth in causing "interfering." There is nothing that puts a horse out of balance more completely than anything wrong with his mouth. Horses that cross their jaws, open their mouths, put their tongues out or over their bits, carry their heads sideways, fuss with their bits, slobber, pull, etc., or "pull out" or "crowd" in double harness, generally have some soreness of the mouth caused by their

bits, and, if they are at all predisposed, are very apt to "cut." We see examples of this every day in cities where dealers get horses from the country that have been chiefly used to snaffle bits. They at once begin to drive them with curb bits, and they nearly all show some discomfort at the change in the various ways already mentioned. It is very common to see a horse cut his legs badly, under such circumstances, that showed no evidence of ever having struck before. The treatment of "interfering" resolves itself largely into methods of prevention. The most important point is to remove the cause, where practicable, and if not, to endeavor to neutralize its operation as much as possible.

If a horse is in danger of "striking" himself on account of the mouth not being in proper order, or from any other exciting cause remaining in operation, protect the part or parts that are likely to be injured, with a boot. If any part is injured from "cutting," keep that part protected until it has entirely recovered from the effects of the injury.

In a large majority of cases after a horse is in good condition, his mouth well made, and he is properly shod, there will be no need for boots, unless he is subjected to some exciting cause, or unless he is markedly predisposed from defective formation.

THE HORSE'S MOUTH

THE discussion of the subject of the horse's mouth has been prompted by observing the thoughtlessness and carelessness of otherwise good horsemen and lovers of horseflesh with regard to the horse's mouth. If a horse has a sore mouth he manifests it in some way unpleasant to his driver or rider, but it is rarely that an examination of that organ is made in order to determine the nature and extent of the trouble. Such an examination is not difficult to make by one at all accustomed to the handling of horses, and can be made as follows: Take the horse into a place in which the light is good. To examine the near side of the mouth, pass the left hand into the off side of it, grasp the tongue gently, and pull it a little to one side—it is not necessary to pull it out of the mouth—in order to expose the branch of the lower jaw, or bar, as it is sometimes called. The thumb of the right hand should be placed in the roof of the mouth so as to separate the jaws, when the part that the mouthpiece of the bit presses on can be easily

scrutinized. The other side can be examined in the same manner by using the hands in the opposite way.

The soreness, however, is not always confined to the bars of the lower jaw, the result of the pressure of the bit, for it is not infrequently found that the lining membrane of the cheeks is excoriated by the bit forcibly pressing the cheeks against the anterior grinders. This form of injury is seldom found in a horse that readily bends his head upon his neck or "gets his nose in," as it is often expressed, unless it is from the use of tight pulley-bridoon bearing reins, which is almost certain to cause it, particularly if a horse bores on it. In the majority of instances it is where a jointed or snaffle bit is used, when a horse "takes hold," and in the case of one not inclined to "bend," that the lining of the cheeks is injured. It can be readily understood, where a jointed bit is used on a horse that does not get his nose in, that when force is exerted upon the reins, it presses the cheeks directly against the teeth, and we can at once realize the great liability to injury of the soft and sensitive cheeks when pressed between two hard bodies, such as an iron bit and unyielding teeth, which frequently have sharp projecting hooks and angles at the very point at which pressure is brought to bear. Horses driven with tight over-checks are particularly subject

to this form of injury to the mouth, as can be understood from the explanation already given. In horses that cannot be made to get their noses in, in riding or driving, and which show evidence of soreness of the mouth in the lining of the cheeks, the front grinders should be kept as smooth as possible. It is impossible for a horse to have a pleasant responsive mouth when the pressure comes upon the cheeks. Nature evidently intended the yielding lower jaw to bear the pressure of the bit, with the soft and elastic tongue to aid in avoiding injury to the sensitive structure which covers the branches of that jaw. Many horses which do not bend their heads upon their necks, when used with a snaffle bit can be made to get their noses in with a curb, which is consequently, when rationally used, the more humane and also the much more effectual in promoting style and action. Occasionally, however, one finds that a horse goes better in a snaffle than in any other kind of bit unless it is one with a smooth and slightly curved, unjointed mouthpiece.

In addition to those already referred to there are many other ill-results from sore mouths, and among the more serious of these are the restless and irritable habits horses develop when being ridden or driven out of the stable, such as going off with a rush, rearing, plunging and balking.

A great deal depends upon the sensitiveness of the individual as to the manner in which he shows his restiveness and irritability when with a sore mouth again facing the bit. A horse of a good, mild temperament may do nothing but show a hesitation in going into the bit and if in double harness hang back for a time, or he will not go up with his mate. Others will go sideways, cross their jaws, press on one side of the bit, or toss their heads in an irritable manner that makes it almost impossible to guide them. High-strung, nervous, determined horses may show their irritability in the more dangerous manner of rushing, plunging or rearing. Drivers of horses are sometimes very much astonished to find a previously well-mannered horse go off with a rush, rear or plunge, but it is remarkable how seldom they think of looking to the mouth to find out the cause for the unexpected display of ill-manners, when in the majority of instances it is to be found there. Even when the lips are tinged with blood from the injured lining membrane it is seldom that an examination is made to determine the extent of the injury. Frequently when an injury to the mouth is pointed out to an owner it is thought lightly of, the extreme sensitiveness of that organ not being realized.

Pinches, abrasions and cracks about the commissures of the lips usually attract attention be-

cause they are easily observed, but they really, as a rule, do not cause nearly the amount of irritation and pain that an internal injury to the mouth does, and they are easily prevented by the use of a circular leather cheek piece on the bit. Some horses that show a disinclination to go into the bit for the first mile or two, after a time begin to pull, and the farther they are driven the more they pull. This is usually the result of a sore mouth, and veterinarians frequently have to remove small portions of bone which have been detached from the jaw by the extreme pressure of the bit. Bad "side-liners" are caused by a chipped jaw or else an extensive excoriation of the soft tissues on one side of the mouth where the bit exerts its pressure. In the healing up of such injuries the tissue with which nature repairs the breach seldom seems to attain the ability to stand the pressure of the bit to the same extent that one not so severely injured does. The fact that such permanent ill-effects are apt to follow injuries to the mouth from the bit should cause the exercise of due care when there is any evidence of soreness. Certainly high-couraged, ambitious horses are predisposed to injuries of the mouth, but they can be largely guarded against by the exercise of care, and it is very important never to disregard "soreness," however slight.

There is probably no animal in which a bad habit is more apt to become confirmed than the horse, and the restless, irritable habits he is liable to develop on leaving the stable are among the most disagreeable. Some horses do not what is called "settle down" when first driven out, but either prance, hop or canter for a varying distance. This is generally accounted for by the owner as being evidence that the animal in question is "feeling too well," or, in other words, is suffering from an exuberance of spirits. This may be the cause, but in the large majority of cases it is attributable to uneasiness in connection with the mouth. Sometimes this discomfort may not be the result of absolute soreness, as a change of bit may cause it. It may be noticed in an otherwise well broken horse where a curb bit is first substituted for a snaffle, particularly if it is placed too low in the mouth and if, as very often happens, the tongue is put over it, in which case a horse is very unlikely to go steadily, and his mouth is almost sure to get sore in a very short time.

The placing of the bit in a horse's mouth is a very important matter in influencing his manner of going. Some horsemen say there is one proper position for a bit in a horse's mouth and that it should always be placed in that position. My experience is that this is best determined by experi-

ment with each individual, and one can tell, by driving or riding a horse a few minutes, as to where the bit should be placed in his mouth. It is usually best to place it rather high at first, particularly when changing to a curb bit, but if he keeps his tongue under it and does not respond readily to pressure, lower it as much as he will stand without showing restlessness. The lower the bit in the mouth, within certain limits, the better, provided the horse will keep his tongue under it and not fuss with it, and face it with a reasonable degree of firmness.

How frequently we see horses go off their feet when going well within their speed at the trot. Sometimes this is the result of excitability, but in nine cases out of ten it is due to a feeling of discomfort or want of confidence in connection with the mouth. Very often this is caused by the arrangement of the curb in giving too much leverage, especially if the hands of the driver are not good. Some horses that go unsteadily with the reins in the bar will go much better in the half-check, or it may be in the plain check, but very often the breaking at the trot is due to an injured mouth. Horse owners sometimes endeavor to overcome this tendency to breaking by giving long drives, and fatigue will temporarily overcome it as a rule, but there are horses that go unsteadily when almost jaded. This tendency can

usually be overcome in a moderately worked horse if the bitting is made comfortable for him and the soreness of the mouth relieved.

Soreness of the mouth is by no means an uncommon one among the exciting causes of "interfering" and may frequently be observed even in well broken horses when a change of bit, particularly a change to a severe one, has produced some injury to the mouth. Fatigue, bad shoeing, rough or slippery roads, and the swaying of a heavy two-wheeler are all exciting causes of "striking," and the awkwardness arising from an imperfectly made (not thoroughly bitted) mouth, with the incidental soreness, is an important factor.

Driving green horses in double harness is a very fertile cause of sore mouths. There are undoubted advantages in handling green horses in double harness, particularly shy, nervous ones, as the break horse inspires confidence in the green one and he is more easily controlled if badly frightened; but one can make more rapid progress in making a mouth in single harness, or in the saddle, than in double harness, for the opportunity of humoring it is better, and there is only one temper to consider. Trainers of green horses usually change the side horses are driven on every day, which is a good plan, as it tends to make them drive straight; but it is a tacit ac-

knowledgment that there is more or less soreness of the mouth.

If the mouth is bruised or excoriated on the portion of the bars of the lower jaw where the bit presses, keep the bit out of it, if possible, until it heals. This need not prevent the horse being exercised, for if a suitable place is available, he can be lunged a sufficient time daily to keep him in condition and under control. The lunging line can be buckled in the noseband of the halter, and no bit need be used. If a suitable place for lunging is not available and it is necessary to lead the horse alongside of another that is ridden, it can be done without the use of a bit by using a tightly applied standing martingale, made with a headpiece and attached to a girth that is kept in its place by a crupper. The headline should be attached to the noseband of the headstall. In some instances changing to a bit that exerts its pressure so as not to interfere with the sore part will answer, as, for instance, the substitution of a snaffle for a Liverpool; but in most instances it is better to keep the bit out of the mouth altogether until it heals. When the mouth is sufficiently healed to stand the pressure of the bit again it is a very necessary precaution before driving for the first few times to take the sharp edge off the spirit of the horse by lunging him

so that the sore part will not be so likely to be reinjured by the animal's "taking hold."

It is well to emphasize what has already been stated, that the front grinders should be kept in condition, so that they can inflict no injury to the cheeks, by having them thoroughly beveled or rounded off with the tooth rasp. This does no harm, provided it is done in a rational way, and is frequently of much benefit in preventing injury to the lining of the cheeks.

TURNING HORSES OUT

In the large Eastern cities the practice of horse owners turning all or some of their horses out for a portion of the year is a very common one. Consequently it is an important matter for them to study this question from every standpoint. For instance, is it wise to turn a horse out if he is going sound, and is in good working condition? Many owners express themselves and act as if it were a benefit to a horse to be thrown into complete idleness at intervals for a time. Others do it with the object of saving expense. Mr. C. J. Hamlin, of Buffalo, whom everybody knows as a gentleman of long experience and also as one of good judgment in horse matters, is said to have given expression to the following aphorism, viz., that "two let-ups are as bad as a break-down." This statement may be considered rather an exaggeration by some, but those who have had an opportunity for fully observing the effects of "turning out" on horseflesh will agree that there is a large measure of truth in it. If you throw a horse into complete or comparative idleness for

any length of time, every active tissue of the body becomes relaxed and incapable of standing anything like severe work. The tendons and ligaments lose their strength, the muscular fibres their tone, the nervous system its power of supplying energy for any lengthened exertion. The relaxing effect of idleness on muscular fibre is well exemplified in connection with the circulation. Take, for instance, a saddle-horse that has been carrying 200 pounds on his back every day all winter and well into the spring, with impunity. The owner is going abroad for three months and turns his horse out. When he comes back he thinks that his horse has had a long rest, and should therefore carry him particularly well. In a short time, however, the horse begins to show signs of fatigue by dropping his head, going heavy in hand, and very likely by "forging."

The next morning the owner goes to look at him and finds he backs out stiffly, and is more or less swollen about the fetlocks, and his feet may feel a little warmer than usual. He is suffering from muscular soreness, the tissues about the fetlocks are congested, the coats of the blood-vessels in the extremities have not tone enough to return the blood with proper force to the heart, so there is stagnation of a portion of it in the dependent parts. That delicate and intricate network of blood-vessels in the feet, from long and compara-

tive inactivity, cannot carry on their function with integrity, so we get congestion and consequent stiffness and shortening of the gait.

"Ah, but," someone explains, "this is only temporary. If you bandage his legs, give him laxative food and light walking exercise for a few days he will be all right again." The chances are he will, but two or three days' work have been lost, and if you then subject him to the same course you will very likely have a repetition of the condition. Yes, and it will be several weeks and more likely months before he is in as good condition to stand work as he was before he went out. During all these weeks or months that have been spent in reconditioning, the muscles, ligaments and tendons are more or less soft and consequently susceptible to strains of varying intensity which may necessitate lying up for treatment. It is not only strains we have to fear, but the comparative inactivity of the circulation during rest renders the legs and feet subject to congestion and inflammation at various susceptible points when abruptly called into activity in doing hard work.

No doubt, by taking time and bringing a horse gradually into work he can be restored to good condition, but to do this there is required management, some expense and tantalizing delay.

When owners are not prepared to bring their

horses gradually back into condition, they will soon have stale-legged and lame horses. One or two seasons of "turning out" and bringing up and abruptly putting into work will often transform a valuable, sound horse into a "screw." Although the legs and feet are the parts that suffer most from this treatment, a horse shows it also in his "top," for it takes a long while to bring back the bloom and finish that go with good condition, after being turned out.

Of course it is a problem for many owners difficult to solve satisfactorily, what to do with their horses when they go away for three months, particularly those horses that are practically sound and in good working condition. It is such an easy solution of the problem to turn them out at some good farm, where they will be sufficiently fed, and kept in safety in a loose box and have a run in a paddock, and only cost fifteen dollars per month apiece. The question is: Wouldn't it pay better to give thirty dollars and have the horses kept in condition, so that they are ready to work as soon as their owners need them? When we come to consider the danger, loss of time, and wear and tear incidental to reconditioning, we must emphatically answer, yes. In the above remarks we have only considered this question from the standpoint of horses that are practically sound and in good condition, but it is

quite another matter when we have to deal with horses that are run down from overwork and other unfavorable conditions, or with pavement-sore and lame horses.

In horses that are run down comparative idleness is almost imperative, and there is nothing much better than a run in a good, shady, well-watered pasture in the early summer, before the flies get too bad. In that way they get the gentle exercise they voluntarily take and get the advantage of the alterative effect that good, fresh grass has upon the system. This, too, is good treatment for slightly pavement-sore horses, particularly if the pasture land is not too dry. Lame horses are, in almost all cases, benefited by rest, and if it is necessary that the rest shall be at all prolonged, the most economical and favorable place to treat them is in a loose box in the country. A horse is bound to get out of condition, anyway, if resting for lameness, and he is usually better in the country, getting lots of pure air and sufficient space for comfort. The beneficial effects of treatment and rest must be followed up by a very gradual process of reconditioning after the lameness has subsided, otherwise the lameness will be apt to recur.

IMPROVING ACTION

BITTING, SHOEING AND CONDITIONING FOR ACTION—I

HORSES that have a tendency to show action can undoubtedly have it very much increased by the adoption of a proper system of training, but there are many without this inclination which it is hopeless to develop to a degree that makes it worth while spending time and effort on them. The influence which contributes most to the development of action is bitting. This requires knowledge, time and patience. Some horses' mouths are much more easily made than others, and there are some it is almost hopeless to try to make anything like perfect. A good mouth is a responsive one. Pressure from both reins should cause the head to bend readily on the neck, while that from either near or off-rein should cause correspondingly prompt flexion. There are some horses that it is almost impossible to bend, owing to the defective anatomical relations of the head and neck, and unless they naturally have a lot

of action, they are not likely, even in the best hands, ever to show very much. A horse with his head well put on his neck, that has a responsive mouth and some ambition, will, when urged, get his head up and nose in, and if restrained at the same time by moderate pressure of the bit, will step much higher than if he has a free head when going at the same rate of speed. Some horses, when going fast, show a considerable amount of action, that at a slow pace will exhibit very little. If such horses have their mouths well cultivated, so that when restrained their force will be exerted to step up instead of stepping on, their action, in front at least, will be much increased. If, however, a horse's mouth is not cultivated to a proper degree of responsiveness, and he is urged into the bit, he will lug or bore and go ahead instead of going up.

To those who are anxious, then, to develop action in their horses, the first step is to endeavor to cultivate a responsive mouth. As has been stated, this requires time and skill. Many horses' mouths are frequently permanently injured by insufficient time being taken for this process. It is a very similar one to teaching a child to write. The tyro at writing cannot regulate the movements of his hand and arm so as to make smooth and regular lines in an easy, flowing manner. The nerves and muscles of his hand and arm have to

be cultivated by degrees to be able to accomplish this. So with the horse's mouth; the nerves of it have to be educated to make prompt and easy response to pressure, and the muscles, acting under the influence of the nerves, have to be strengthened and developed, so that the head can be bent on the neck and properly carried without discomfort to the individual. The head should not only be bent on the neck to a reasonable degree, but should also be steadily carried.

The first step in the process of making a horse's mouth is to get him used to the pressure of the bit without showing restlessness. No pressure should be brought to bear upon the tongue by means of the reins until the horse will stand a bit in his mouth without fussing. The bit should be placed sufficiently high in the mouth, so that there is no temptation for the horse to get his tongue over it. The old-fashioned plan of putting a big, thick bit, with keys hanging from it, placed low in the mouth, is entirely erroneous, as it gets the colt into the way of fussing with his tongue all the time, which is a habit to be avoided. In a good mouth, if the horse is comfortable, his tongue lies quietly in the groove formed by the branches of the lower jaw, and acts as a protective cushion in preventing injury to the delicate and sensitive covering of the bars and the bars themselves. If, then, through faulty manage-

ment, the tongue is not by degrees trained to stand the pressure of the bit, the horse is sure to develop some irritable habit with that organ, such as putting it over the bit, drawing it up in the mouth, or "lolling" it. The result of the two former habits is that the bars of the jaw lose the protection of the tongue and become exposed to the pressure of the bit, which they cannot stand without suffering pain and injury. Consequently the mouth becomes very unsteady, loses its responsiveness, and the horse is put off his balance, so that he is apt to go off his feet, hitch, and go cornerwise instead of straight.

Putting the tongue over the bit and retracting it in the mouth has the further ill-effect of making a horse show irritability in a variety of ways, such as crossing the jaws, carrying the head sideways, throwing the head up, keeping the mouth open, slobbering, frequent movement of the head instead of a steady carriage of it, which is so important in conducing to a responsive mouth. Putting the tongue over the bit soon becomes habitual with some horses, and it is quite a difficult matter to remedy effectually. Spoon bits and all such mechanical contrivances to prevent it are very unsatisfactory, as a horse is never comfortable with them, and never carries a steady head with any of them in his mouth. It can, however, be cured by gradually getting a

horse used to the presence and pressure of the bit on his tongue. Putting the tongue over the bit becomes such a confirmed habit that some horses will do it as soon as the bit is put in the mouth and before any pressure whatever is brought to bear on the tongue by the bit. This aggravated form of the habit can be remedied by using an ordinary ring bit with a straight mouthpiece. This should be placed high in the mouth, so that it is impossible to put the tongue over it, and left in all day except when the horse is feeding. In two or three weeks' time the horse will become accustomed to keeping his tongue in its proper position with respect to the bit and stop trying to get it over.

This, however, is only the first step, and the next and most important one is to get the tongue used to pressure. To accomplish this, attach reins to the bit and buckle them to a roller at the withers. For some time they must be left very loose, so that the bit will exert no pressure unless the horse extends his nose beyond its usual position. In this way he will be brought to experience, by degrees, a little pressure on the tongue. For a time he should be lunged daily with the reins loose, so that he will get used to the presence and occasional pressure of the bit when in motion. Very gradually indeed the reins may be tightened, so that after some weeks the subject may

gradually be brought to stand moderate pressure on the tongue, and by still slower degrees may the bit be lowered in the mouth until it reaches the lowest position the individual will stand and still keep his tongue in place and carry his head steadily. Very great vigilance must be exercised to see that the tongue never goes over; if it does so by any chance, immediately raise the bit, and lessen the pressure.

When sufficient progress has been made, as evidenced by the ability of the tongue to stand pressure when the subject is in motion, he may be ridden or driven. A rider with good hands can accomplish much in cultivating the mouth and can humor it so that the horse may gradually be brought to stand pressure. It is better to use the horse in single harness than in double, as his mouth can be better humored where there is only one temper and mouth to consider. The necessity for getting the tongue used to standing the pressure of the bit cannot be too much emphasized, but of course there is a limit to this, and some horses that are lacking in sensitiveness will stand pressure on their tongues until they become black and blue, thoroughly dried up in some cases, projected from the mouth, and the mouth kept more or less open. The most important exciting cause of this fault is placing the bit so high in the mouth that the horse will not

bend his head upon his neck in response to the pressure of the bit. All this may be overcome in many instances by lowering the bit an inch or two in the mouth, when pressure of the bit will cause responsive giving of the jaw and thus relieve the tongue of undue pressure.

A horse should never be allowed to go with his mouth open, as it becomes dried, which lessens the sensitiveness and responsiveness of that organ and encourages pulling. If a horse shows a tendency to keep his mouth open, try to determine the cause, as it is sure to be due to some discomfort in connection with the mouth. In addition to removing the cause, any tendency to this fault should be checked by the use of a tight noseband. The mouth must be kept closed, as a horse never goes nicely with it open. Although faulty mouths are usually the result of careless, thoughtless, unskilful management, it must be acknowledged that there is a decided predisposition in some horses to what are called bad mouths. When this tendency does exist, however, it can usually be overcome by rational management and a pleasant, valuable, useful horse kept from becoming an uncomfortable brute, much lessened in value from the possession of a bad mouth.

The horse with a small tongue and narrow, sharp bars, is apt to be very sensitive to pressure and easily made to develop irritability and

unsteadiness of the mouth; but if he is taken cautiously and carefully with easy bits, and gradually brought to stand pressure, he is likely to develop a delightfully responsive mouth. Some horses, on the other hand, have thick, leathery tongues, which it is almost impossible to make responsive, owing to their lack of sensitiveness. This inherent lack of sensitiveness of mouth is occasionally associated with a corresponding lack of sensitiveness of the skin, so that the horse does not feel the whip. I have had experience with individuals of that sort that were free-goers and determined pullers, in which there was something evidently lacking in the nerves of sensation. Cases are, of course, exceptional, where there seems to be a general lack of sensation, but it is not so rare to find a leathery mouth.

In addition to the hyper-sensitiveness of the mouth in some horses and the lack of sensitiveness in others, necessitating unusual care in making their mouths, some horses have anatomical defects which preclude the possibility of them ever having anything like perfect mouths. Those with necks below of a length disproportionate to the length of the necks above, particularly if such necks are deep at their points of attachment to the head, it is impossible for the head to be bent upon the neck so that the mouth may be responsive. A horse formed in this way is bound to

stick his nose out, and when pressure is brought to bear upon the lower jaw with the bit it slips up in the mouth towards the grinders, and does not exert leverage upon the jaw at a place of vantage or so that the head can be bent upon the neck. As a rule, ewe-necked horses show this inability, but not all, by any means, for some of them are clean-cut in the throttle, and the neck just above the throttle is light, so that it can bend with ease.

In addition to the causes already explained, temperament predisposes to pulling. A free, courageous, determined horse is much more apt to get into the way of pulling than one not over-burdened with energy. Of the exciting causes of pulling, insufficient work and over-feeding are important; but really the most fruitful one is the unskilful and heavy-handed driver. Some drivers will make almost any horse pull. Many have no sympathy with a horse, and if they do observe evidences of discomfort in connection with the mouth, which may be shown in some of the ways already explained, they do not endeavor to remove the cause. It is most important in bitting horses to prevent them from getting into bad habits of any kind. They get into bad habits very quickly, which it may take a long time to eradicate. The most rational principle to proceed on is not to allow them to learn bad habits. Do not place them in a position to learn bad habits.

IMPROVING ACTION

BITTING, SHOEING AND CONDITIONING FOR ACTION—II

In my last article on this subject I drew attention to the fact that bitting, or "making the mouth," is by far the most important matter to attend to in contributing to action. You must get the head up and the nose in, and cultivate a responsive mouth, so that when a horse is urged and restrained, he will step up instead of stepping on. It was urged that care should be used against getting horses into bad habits in connection with the mouth in the process of bitting, such as getting the tongue over the bit, retracting the tongue, side-lining, going with the mouth open, tossing the head, carrying the head unsteadily, and so forth. If some of these habits are developed, they will tend to neutralize any beneficial efforts that have been made in the cultivation of the mouth.

An easy bit should first be used, such as a straight-barred ringed one or a snaffle, so that the

colt will face it firmly and carry a steady head. In the development of speed, it is also imperative to use an easy bit, but for the production of style and action, a curb bit is almost indispensable for the majority of horses. The inexperienced ones are apt to think that a curb bit is an instrument of torture. The ignorant, thoughtless and rough handler of horses can easily make it so, but if it is properly used it is really more humane for use in many mouths, than a less severe one. The curb bit gives very much increased leverage, and will make some horses bend that cannot be made to do so without it. As soon as they bend, it requires very little force to keep their noses in, and very little pressure need be exerted, so that there is no injury nor irritation resulting. In addition to this, the pressure is divided between the interior and exterior of the mouth, the curb chain exerting its share of the pressure just behind the lower lip.

Some free, courageous horses, especially if short of work, will pull to a most uncomfortable extent, both to themselves and their drivers, if driven with a snaffle bit. The same horses, if used with curbs, will go without taking hold, and with the exertion on the part of their drivers of very slight restraining force. The perfect handling of a horse with a curb bit is a very fine art, by which are produced the perfection of carriage and the

maximum of style and action. To realize fully what the perfect handling of a curb bit means in promoting style and action, one has only to observe a horse skilfully handled with one, especially if he has a good mouth. The dexterous rider or driver brings out all the responsiveness there is in the horse without causing him to fight, while the unskilful handler allows a horse to carry himself imperfectly and gets him off his balance, thereby lessening his gracefulness, style and action. The change from a snaffle to a curb bit should be made carefully and discreetly, as it takes a horse some time to get used to the change. We have good opportunities in the city of observing the ill-effects of the abrupt change. A dealer gets in from the country a horse that is possibly well broken, but has never had a curb bit in his mouth. He hitches the horse, puts a curb bit in his mouth, and "pulls him together," as it is expressed; that is, he urges him with the whip and restrains him to get all the style and action he can out of him. He is very much encouraged to see his new purchase make such a good showing. The next day he puts the horse in harness, but finds that he does not go so well, showing irritability in connection with his mouth. The horse may hold his head sideways, open his mouth more or less, put his tongue over the bit, toss his head or carry it unsteadily, pull, hitch, go off

his feet, or interfere. He may display any one or a combination of these faults, showing that he is uncomfortable and out of balance.

Why this quick alteration in the manner of going between the first and second hitching? It is simply due to the fact that the delicate tissues of the mouth have become bruised or abraded from the rough handling of a bit with powerful leverage. The horse's mouth is sore, and he cannot face the bit without showing irritability, which he manifests in the ways described. The curb bit feels different in his mouth, the pressure on the tongue is greater, and if the curb chain is tightened and reins buckled to the bit, so as to give much leverage, many horses will chafe under the newly experienced increased restraint, and will pull, thereby greatly increasing the injury to the mouth. If this is repeated, the mouth is spoiled and bad habits produced.

In getting a horse accustomed to the curb bit, it is a good plan to let him stand with it in his mouth in the stable for a few hours a day. This gets him used to the shape and size of the new bit, after which pressure can by degrees be brought to bear on it. Some trainers are opposed to the use of a dumb jockey. Of course, the mouth cannot be perfected by the use of this device alone, but it is a very useful auxiliary to other measures. The dumb jockey is a rubber

contrivance attached to a girth and crupper and with elastic reins to buckle to the bit. The prejudice against it is largely the result of the irrational manner in which it is used. In the majority of instances the reins are buckled too tightly at first, causing too much pressure on the mouth, and forcing the head and neck into an unnaturally constrained position. This, instead of cultivating responsiveness of the mouth, causes irritation of that organ, gets a horse into fussy habits, and makes him lie on the bit, doing more harm than good. One not infrequently sees a horse standing in a stall with a dumb jockey on him, his mouth partly open, his tongue over the bit, and boring down on it, and sweating profusely from the discomfort he is suffering. A dumb jockey used in this way is worse than useless. One of the objects of using a jockey is to get the nose in, and from the manner in which it is used by many it is evident that they seek to accomplish this by sheer mechanical force, forgetting that they are training nerves and muscles to responsiveness, which can only be done by degrees.

As soon as a horse shows evidence of discomfort, loosen the reins and tighten them gradually again. If the subject draws his tongue up in his mouth, or puts it over the bit, raise the bit in his mouth. Some horses get their heads too low

with a dumb jockey on. In such it is of much benefit to use a bearing-rein attachment to keep their heads in proper position. The benefit from a dumb jockey used in a stable is enhanced by using it when a horse is in motion. Some horses will bend when standing that will not do so when moving, and so have to be trained to it. Beneficial as a dumb jockey may be, a rider with good hands, that can use his legs on the horse's sides, urging him by degrees into proper position with hind legs well under him, and head up and nose in, can accomplish more, as he can humor the horse at will. Next to riding, driving in single harness is best, as it is hardly possible to humor a horse's mouth as well in double as in single harness. The tendency with most trainers is to hurry matters too much. Urging a horse into the bit too soon causes him to fuss with his mouth and is apt to make him fight the bit. The successful trainer needs a lot of patience and perseverance.

If, in the process of bitting, the mouth by accident gets sore, rest it by keeping the bit out of it until it is better. This can be accomplished in the country or in a small town, without keeping a horse altogether out of work, by putting on the cavesson and dumb jockey and having the reins tightly buckled to the cavesson and led alongside of another horse in this way or lunged. It is a bad plan to let a horse that is in the pro-

cess of bitting or breaking get too fresh, as he is apt to reinjure his mouth when he is put in harness again.

Curb bits for driving are so made that different degrees of leverage can be exerted. It can be laid down as a rule that it is not wise to use any more leverage than is essential, otherwise the mouth is apt to become sore and carried unsteadily.

There is some diversity of opinion as to the wisdom of using bearing reins. Some people, particularly the inexperienced, are very much opposed to their use. Occasionally one finds a horse —much more rarely a pair—that carries himself so well—head up, nose in and head steady—that a bearing rein is superfluous. The majority of horses, however, carry themselves better, drive more comfortably, and are really more comfortable themselves when driven with bearing reins. They can, of course, be made instruments of torture, if used too tightly buckled up and for too long periods at a time, but most horses will not only carry their heads too low, but bore, pull and "duck" if not "borne up." The low carriage of the head is not only unsightly in a carriage horse, but causes too much weight to be thrown on the forelegs for their welfare. The French check is very much better than the pulley bridoon. The bearing rein should not be used so tightly that a horse cannot bend his head upon his neck,

if he is capable of doing so. The bearing reins should seldom, if ever, be used on the driving bit; if it is at all tight, it pulls the bit too high in the mouth, causing a horse to bore and usually to bruise the bars severely immediately in front of the grinders. A jointed bit should be used in the mouth in addition to the driving bit and the bearing rein buckled to it.

So far we have been referring to bitting only as having a contributing influence in increasing the forward or knee action; but it has also a marked effect in improving the hock action. It is remarkable how much the hock action can be increased by cultivating a responsive mouth, dropping the nose into its proper position, or, in other words, balancing a horse.

Before we leave the subject of the mouth and bitting altogether, we must refer to condition as an important factor in contributing to action. Before a horse can be made to show all the action there is in him, he must be toned up to the highest pitch. He must be full of nervous energy, and his muscles thoroughly developed. He must not only feel like doing it, but must also have the power. It takes time to bring this about. The cultivation of the mouth and the toning up of the system should proceed together, but never let the toning up get ahead of the education of the mouth. It is better not to have a horse feel-

ing too well while you are cultivating his mouth, for, if his spirits are too exuberant, he will not learn so fast, and is apt to fight and increase his chances of developing bad habits. In cases in which action contributes to a horse's value, he must also look well. Without being too gross, he should be in full flesh; it should be well put on, and there is nothing like a lot of slow work for this. From an hour to two hours' walking exercise every day will make the flesh look solid and give a finish which a horse merely fattened up without work never shows. Slow work, if a horse gets a sufficiency of good feed and proper grooming, will not prevent the accumulation of flesh as fast work does, and it keeps the manners of the individual good. The development of speed in trotting-bred horses is a slow process with many of them. It takes several years in some individuals to bring it to its zenith. This is in a measure also true of action, if we look to perfecting it. A good deal can be accomplished in a couple of months with some horses, but much more can be attained in two years. We have examples of horses well known in the show rings of this country to-day that have gone on improving in brilliance of style and action for years. Bitting and conditioning are the chief contributing factors.

The practical man who is conditioning and de-

veloping horses' action, for sale, is limited as to time. He cannot afford to spend it and he has to be guided too much by circumstances, but the principle of development is the same, whether for the market or show ring. A great deal is said about shoeing in contributing to action, and it is a point that should be studied and carefully attended to, but it is decidedly secondary in importance to either bitting or conditioning. Some years ago a great deal of weight was used in shoeing show and sale horses. You would frequently see a horse weighing from 1,000 to 1,100 pounds carrying on each forefoot from one pound and a half to two pounds weight, and even more. This answers for some purposes and before some judges, but if an owner wishes to sell or show a horse on his merits, it does not do. A lot of weight on a horse's feet will make him show more action for a short time, particularly if shown in hand and if he is feeling fresh and well. If, however, he is called upon to exert himself for any length of time, especially if the going is heavy, and if he has to draw any weight, he will soon begin to labor, pound the ground, very likely forge, and the character of his action will be destroyed. With a good judge, the character of the action is of more importance than the amount of it, and he would not look a second time at a horse that labors and pounds, no matter

how high he goes. One has to be guided by the individual, and the object in view in determining the amount of weight to put in a horse's shoes, in order to get the best results in the way of action. From 16 to 22 ounces is usually sufficient, but there are horses for which a little less or a little more may be carried with advantage for sale or show purposes.

In addition to carrying a moderate amount of weight, the hoofs should be allowed to grow to a fair length. Length of toe causes a horse to exert increased effort in raising and extending the forelegs; so the tendency is to increase the action. Defects of action can in a measure be corrected by modifying the shoes and form of the hoof. For instance, some horses extend too much and do not fold or bend their knees sufficiently, but what is called "point," and are apt to go on their heels, or come down heel first, instead of planting the foot squarely, heel and toe at the same time. For this defect, have the toes fairly short, lighten the web of the shoe at the toe, and increase its weight gradually towards the heel. With a horse that folds too much and does not extend sufficiently, put the weight towards the toe and lighten the heel. In a horse that "dishes" or "winds out," the heavy portion of the web should be in the inside branch; while in a horse that "winds in," just the opposite should be done.

In carrying out these modifications, they must be done so as not to interfere with the level of the foot. If a horse does not tread level, ill-results, in the shape of lameness or wear and tear of the leg and foot, are likely to follow.

EXERCISE FOR HORSES

EVERYBODY who owns or has to do with horses in any way, recognizes that exercise is necessary for them in some way or other. Judging, however, from the practice pursued by many persons, one cannot but conclude that opinions differ widely as to the amount necessary, the manner in which it should be given, the character of it, and the circumstances which should guide one in prescribing it.

In giving the subject reasonable thought we must first of all recognize the fact that the horse is so constituted that he is naturally an active animal. In fact, activity is his paramount characteristic. If from any cause he is brought to lead the comparatively vegetable existence of the sheep or cow, his powers become more or less impaired, temporarily though it may be.

Recognizing as we must the basic principle of a horse's inherent activity, we can make deductions as to his reasonable treatment which are borne out by experience. It is not my intention

to make theoretical statements in treating of this subject, but to endeavor to give some practical hints that may be of some use in the everyday treatment of horses. It is not convenient to draw a line of demarcation, in the treatment of this subject, between exercise and work, though one might be able to define the difference to suit one's views.

If one were asked to explain the effects of reasonable work on a horse's system, one might truthfully state that there is no healthy part of his organism that is not beneficially affected by it. Judicious work stimulates the appetite, promotes digestion, encourages assimilation or the conversion of food into nutritive material. It not only has an important influence on these functions already mentioned, but in a greater degree it aids the various tissues of the animal to take from the blood those elements required to restore the loss which is going on all the time, and also to promote their growth and development. Further than that, it helps the system to get rid of material that it has no further use for, and which, if allowed to remain, will prove prejudicial to it.

The casual observer will almost be able to determine the change which takes place in a horse, when not sufficiently worked, if he will give it a little thought. If he is at all liberally fed, he will not only retain his flesh, but will gain in weight.

But what about his muscular tissue? It apparently looks as bulky as ever. So it is and possibly more so, but that it has become impaired in muscular power can easily be demonstrated by an hour's brisk work in the case of a driving horse. He goes out full of life, and possibly shows to the best advantage for a short time, but soon begins to drop his head, go heavy in hand, in fact to lag, loses his action, and very likely forges. This demonstrates the fact that, no matter how well a horse may seem nourished, he cannot maintain his muscular tone and muscular power without adequate work.

The changes that take place in the muscles of locomotion also take place in the muscular tissue of other parts of the individual. The central organ of the circulation, the heart, is a hollow muscle, and the blood vessels have muscular fibres in their coats. If a horse is insufficiently exercised, the muscular tissue of the heart and blood vessels becomes impaired in power, as that of the muscles of locomotion does. If a horse in such condition is abruptly put to brisk work, the circulation is apt to show weakness, and there is danger of congestive and inflammatory attacks. A horse out of condition and lacking in muscular tone will develop congestion of the lungs, from an amount of exertion that would have no injurious effect upon one in moderately good condition.

If the muscular tissue of the heart is weak, that organ lacks the power under severe exertion to force the blood through the lungs, when stagnation and congestion follow.

Horses in the condition just described, if given a long, quick journey on a hard road, are apt to develop founder or inflammation of the quick of the feet in its most intense form. The circulation being weak, the concussion resulting from the pounding on the hard road interferes with it, and congestion and inflammation are apt to result.

The amount and the character of exercise to be given during convalescence is an important point in influencing the hastening of that process, as well as in determining the completeness of the recovery and the prevention of untoward sequels. Even during sickness the restricted and gentle movements possible in a box stall of fair size not only contribute to the patient's comfort by admitting of freedom and comfortable attitudes, but the slight exercise has a beneficial effect upon the circulation, particularly that of the legs.

After attacks of influenza, strangles, laryngitis or pneumonia, and as soon as the temperature has regained its normal condition, the question of exercise should be considered, and judgment should be used in determining how soon the

patient can stand exercise. Sometimes a couple of days after the temperature has become normal and the appetite is regained in a measure, the patient shows strength enough in movement to justify one in concluding that he can stand a short walk. He may be only able to stand a few minutes' or he may be able to stand ten minutes' gentle leading, but usually each succeeding day it will be found he can stand a little more. If he can stand ten minutes a day, it is better, if possible, to divide it into two periods of five minutes each. In my opinion this applies to all exercise, whether that given during convalescence or conditioning for market, for the show ring, or for the race track. Exercise rouses the circulation, and in fact all the activities of the organism, with beneficial results.

Much better results can be attained by stimulating the functional activity of all the organs of the body twice in the twenty-four hours, than once. The period of convalescence is very much shortened by pursuing this plan, and the horse can be put to work much sooner, and with less danger of relapse. Those in charge of horses will often keep a convalescent one in a box stall until he gets full of life, then hitch him up. He will be for a few minutes full of vim and go, but will soon begin to sweat from the too violent exertion he gives himself. Violent exertion abrupt-

ly given is very apt to be followed by a relapse after the weakening effects of illness and the consequent inactivity.

Plenty of walking exercise during convalescence from affections of the breathing organs is the only course likely to ward off defective wind, which so frequently occurs as a sequel to these affections. One often hears it advised to turn a horse out for a few weeks after attacks such as referred to. This means a run at grass in the summer, and in the winter turning in to a box stall. In either case too much bulky food is apt to be consumed to be favorable to good wind, and systematic exercise is not given. Of the two courses, turning out to grass is the better, as the food is of a laxative character, and the animal takes some exercise. But the best of all is to keep the horse up so that the amount and character of the food can be regulated and a definite amount of exercise given. Walking exercise during convalescence from acute affections of the breathing organs brings these organs gently into play, rouses mildly their functional activity, and is the only safe way to tone them up, and prepare them by degrees for more violent exertion, which they can then perform without showing any unsoundness of wind.

Swelling of the legs occurring from any cause —for instance, as a sequel to pink-eye—can be

got rid of much more promptly by judicious exercise than by allowing the horse to stand; and much time can thus be saved. Keeping in a box stall facilitates and hastens the process, but half an hour's walking exercise should be given twice a day. When the horse is not being walked, his legs should be properly bandaged with cotton batting and in the majority of instances the swelling will be practically gone in a few days.

For sale horses and for show horses, walking exercise is a most important factor in enabling those in charge of them to attain their objects. A sale horse must be fleshy to attract most purchasers. Dealers all over the world recognize this fact, as well as the one that good, fresh-looking legs contribute in a marked degree to a horse's saleableness.

Walking exercise does not to any appreciable extent take the flesh off a horse, nor does it make the legs stale. Flesh put on under walking exercise is harder and gives a more finished appearance to a horse. This form of exercise also stimulates the circulation of the legs, keeps them clean and renders them hard, so that when a horse so treated is put to more violent work the tissues of the legs can stand it without showing wear and tear.

In the case of show horses, plenty of walking exercise is of even more importance than in sale

horses. Show horses must be fit to do themselves and their handlers credit. In many of the rings the going is heavy and horses that are likely to be in the ribbons should be in shape to stand a severe test. If they are not fit when they are called upon to make a final effort, they will not be equal to doing their best. Many a ribbon is lost through a horse becoming fatigued and losing his action and brilliancy in consequence. This is particularly the case in heavy harness horse classes. Walking exercise will do for a good deal more than half of it. After a show horse is well broken, three times a week is plenty to hitch him, and the day he is hitched he should also be walked once, and all other days twice. This plan will get him fit, allow him to keep in flesh, keep his mouth fresh, and his legs from getting stale, all of which are important points to consider in a show horse. Exercise twice a day contributes in a large measure to good manners. This is not an important point in some well broken horses of easy disposition, but in others that are apt to "get above themselves" if not well exercised, it is an important one. Nothing helps to improve a half-broken horse more than to go out twice a day.

THE HORSE'S COAT IN SPRING, SUMMER, AUTUMN AND WINTER

THE state of a horse's coat indicates, in a considerable measure, the general condition of the individual. If the coat gets into bad condition in a horse that is worked, it will soon injuriously affect his general health, which will show itself by loss of flesh, life and vigor. The care of the coat then, outside of the question of appearance, has an important influence in contributing to a horse's well-being.

If we had summer-like weather all the year round, with its genial warmth to encourage the activity of the skin, we should have very little trouble with the coat, as it would then remain short and sleek, with very little care. With the changes of season, however, and great variations of temperature, we find marked alterations in it. The horse's skin, and its appendage, the coat, are very sensitive to climatic conditions, and nature makes an effort to change the coat to suit altered states. Nature is very successful in this while a horse is roaming about under natural con-

ditions, and a horse so circumstanced can stand great extremes of temperature without suffering; but as soon as he is put to work and exerted to a sufficient extent to heat him up, he then requires artificial care, in order to maintain good condition.

As has been already stated, the coat is more easily kept in a satisfactory state during the summer than at any other season of the year. The heat of summer encourages sweating, and this is beneficial rather than injurious, within certain limits, so long as the horse "cools out" and dries up in a normal manner. This is more readily accomplished in the summer than at any other time, owing to the shortness of the coat, and the little danger from drafts at this season of the year. Nothing is more injurious to a horse in this connection than allowing his coat to remain wet. At certain times of the year, when it is long, some horses will remain wet for hours after having been exerted, unless they receive great attention. The frequent occurrence of this will soon cause unthriftiness. Standing with a wet coat in this way frequently has a most relaxing effect upon the system, and must be guarded against. In summer time there is very little difficulty about this, but there is one form of treatment very much neglected in hot weather, which is of great benefit if properly applied. The coats of horses that

are frequently warmed up in hot weather get sticky, greasy and stained, and it is almost impossible to get them perfectly clean and glossy without giving them a good washing at intervals. Some horsemen are afraid to adopt this treatment, but it is not at all dangerous, and most beneficial if properly carried out. As a rule it is only necessary on very hot days, and if it is done on cool ones, care must be taken to "dry out" carefully to avoid chills. When a horse comes in on a hot day, having sweated more or less profusely, water that has been warmed in the sun should be freely sponged over him. This should then be thoroughly scraped off, and a woolen cooler put over him; then he should be walked for a while, if possible, until he cools out. As soon as the coat is dry, grooming will make him look and feel fresh and well. It is not always necessary to use a cooler in "cooling out" when it is very warm.

The autumn is the most trying time of the year to keep the coat in a satisfactory state, for several reasons. A partial moult takes place at this time, rendering the skin irritable to some extent. Besides, there are the extremes of cool nights and warm days. The cool nights cause the coat to grow and increase the tendency to sweating when the animal is exerted during the heat of the day. From the increased length of

coat it becomes much more difficult to dry a horse after work, and he is apt to suffer unless great care is taken to protect him from the ill-consequences of standing with a wet coat. This difficulty becomes so marked in some horses at the end of September and throughout October that those in charge of them begin to discuss the advisability of clipping.

As a general rule, clipping should be deferred as late into the autumn as possible, or until the temperature of the day and night are not so much at variance; then the growth of the coat lessens considerably. A horse clipped on the 10th of November may not require clipping again for two months or more, while one clipped on the 10th of October may need it again in two or three weeks. Horses clipped early in the autumn usually have very dry-looking coats, and it seldom improves their appearance, though it does in a measure relieve them from the ill-results of standing with wet coats, especially if it is repeated several times during that season.

Every reasonable effort should be made to put off clipping until November, and the necessity for it may be avoided in nearly all cases until then. This can be accomplished in most instances by care in proper blanketing. A light sheet may be all that the horse can stand in the day time without sweating, but at night he should be kept

fairly warmly blanketed to check the growth of the coat. It is usually necessary to begin this the end of August. Discretion, of course, must be used, so that the covering is not heavy enough to cause sweating. Some horses have naturally fine short coats, and with ordinary care will not need clipping, even in winter, which is so much the better; but the majority of them need it, and are much benefited by it.

Under certain circumstances, as in the case of horses having been turned out and brought up for work, say in April, it will be beneficial to clip them, for otherwise they look badly and will not thrive well on account of sweating too freely when worked.

Clipping at this season of the year retards the shedding of the roots of the coat, and it is better to let it shed naturally in case the conditions are such as will admit of it, without injury to the horse's condition and working ability.

In a horse that is not too ambitious and has not to be exerted violently, it is better to wait for him to shed naturally, which he will do rapidly at this season of the year if he gets regular work, good grooming and is well fed. Horses that are fed warmed boiled feed for the evening meal will shed much earlier in the season than those kept on dry feed. Some horses, however, will not stand this without becoming too relaxed in

the bowels, especially if worked hard more than once or twice a week; others will not stand it at all without scouring. Care in all instances must be exercised not to feed an excessive quantity. In clipping saddle horses the mistake is usually made of including the part covered by the saddle, and a great deal of trouble frequently results in consequence. Newly clipped horses, particularly if they are not thoroughly used to the pressure and friction of the saddle, are very apt to develop an eczematous eruption under it, and even horses regularly used for saddle work are not immune to such injury after clipping.

The layman is apt to assume that an attack of eczema coming on under the conditions described is due to derangement of the blood or the digestive organs. While derangement of the blood or the digestive organs may predispose to an attack of this nature, some local irritation is usually needed to determine its development. It is obvious that a considerable amount of local irritation must result when the skin, divested of its coat, is, for an hour or two daily, subjected to the pressure and rubbing of the saddle. The rubbing action is further intensified by the sweating that almost always takes place under the saddle. Another contributing cause is the rapid drying and cooling of the skin when the saddle is removed from a clipped horse's back. The rapid

drying and cooling is apt to have a deranging effect upon the circulation of the skin at this part, and consequently conduces to inflammation of that covering.

Eczema under the saddle is more apt to occur in cold than in warm weather. More than fifteen per cent. of the saddle horses clipped in midwinter develop this affection under the saddle, while not more than one per cent. with backs unclipped show it.

When harness horses develop it, it is on the parts subjected to most pressure that it first shows itself, as under the collar and back pad. The eruption has a great tendency to spread, and beginning on the skin covered by the saddle, often extends over the whole of the back and side.

Occurring, as it frequently does, with a number of clipped horses in a large stable, it is thought by stablemen and owners to be contagious, but it is not so. It is apparent, then, that clipping the coat under the saddle is a bad practice. Even in cases in which an eruption does not take place, the rubbing is apt to cause temporary baldness and troublesome abrasions, particularly if the skin has not been toughened by long and continual pressure and rubbing of the saddle, the result of steady saddlework.

THE CAUSES OF DIGESTIVE DISORDERS—I

The breeder and horse owner have not the time or opportunity to acquire expert knowledge of the diseases of the horse, but it will well repay them to give a little thought and study to the causes of preventive disorders, particularly to those of the digestive organs. The exercise of a little thought and judgment in the management of a stable of horses will lessen to almost nil the occurrence of digestive ailments among its inmates. There are certain affections to which horseflesh is heir which it is impossible to prevent under some circumstances, but those of the digestive organs can be very largely prevented.

We must study these causes under a number of heads. First of all there is the condition of the individual at time of feeding, the quantity of the food, the character of the food, and the form in which it is given. Under the foregoing heads I have not included the natural predisposition of some animals to digestive troubles, for the inherent tendency to some affections can-

not be classed among the preventable causes, but, nevertheless, a little extra care may neutralize the tendency to them. Take, for instance, a horse of a nervous temperament, with a light middle-piece. Such an individual is very liable to scour when first taken out, and in some horses this cannot be prevented; but careful attention in giving non-laxative and easily digestible food in properly regulated quantities, with care about watering and the avoidance of violent and overtaxing work, especially when first taken out, will often control this tendency. If nervous, light-middled horses can once be made fat by proper dieting, and are kept in health by light, slow work, the inclination to scour will be much lessened. The accumulation of fat in the abdomen has a tendency to lessen the violence of the action of the bowels and thus to counteract scouring. Horses of the temperament just referred to are better fed on corn than oats, as corn is more fattening and less stimulating to the nervous system, so that horses fed on it are less inclined to be excitable. Greedy, voracious feeders are predisposed to digestive ailments from their tendency to overtax the digestive organs by the consumption of too large quantities of food too hastily eaten. The means of prevention of such a cause is apparent and easy of application. These are examples of two inherent predisposing causes:

A feed that an animal can take with impunity and possibly with benefit under some circumstances, may prove an exciting cause of that very serious trouble in horses, acute indigestion, under other conditions. Take, for instance, a horse that is to be called on to do an unusually long and hard day's work. The anxious, over-zealous and well-meaning driver will, in some instances, give an extra-sized morning meal, with the idea of buoying the horse up for the ordeal of the day. As soon as the horse has had time to consume it, he starts on his journey; it may be to pull a heavy load, or for faster work. The more violent the work, the more will the digestive process be interfered with. As soon as the course of digestion is arrested, fermentation begins and it may go on to such a degree that the horse soon begins to show signs of something being amiss. He most likely came out of the stable showing life and energy, and went at his work with spirit, but after going a few miles, however, he begins to sweat more than he should, to lag, to drop his head and to bloat. As soon as he is allowed to stand he shows restlessness and becomes demonstrative in his exhibition of pain. He has acute indigestion, due to mistaken kindness on the part of his attendant. Instead of having been given a full feed or rather more than usual, he should

have had less, and the first opportunity taken of giving him another small feed.

We have the same thing occurring under different conditions, as, for example, when a horse has had an unusually hard day's work and is very tired. He is put in the stable and given his usual meal, which he eats. After an hour or so he begins to show signs of abdominal pain. His attendant cannot understand the reason for this, as the horse has only had his usual feed. He does not realize that the horse's vital powers have become very much lowered, the result of unusual fatigue, and that the stomach participates in this temporary inability and becomes, for a time, unequal to exerting its full digestive powers, and that indigestion has resulted in consequence. Had the horse been allowed to rest for a time, given a little water and allowed to nibble hay, he might have been fed with impunity, although it is usually a wise plan to lessen the feed if a horse is unusually fatigued. The condition, then, of the individual has to be considered in determining the amount of food he should get. Horses that are in good condition, having regular hard work and full feed, are much less liable to be affected by unusual fatigue and full feed than those that are irregularly worked.

In addition to the necessity for caution in feeding when a horse is fatigued from hard work,

long abstinence also necessitates care. A horse that has had his stomach empty for a long time, whether fatigued or not, is usually ravenous for his food, and is apt to consume a full allowance of concentrated food too hurriedly to permit digestion to go on satisfactorily. The old plan of giving a little thin warm gruel to a fatigued fasting horse is a good one, in order to prepare him for his full meal later on. It is not always convenient to furnish this, however, and the next best plan is to give a couple of quarts of water and a little hay, to get the stomach into working order before the full meal of concentrated food is given, preceded by more water.

The quantity of food to be allowed a horse is not only an important matter of study from the standpoint of economy, but is a very material one to consider in connection with the question of preventing digestive disorders. The statement can hardly be gainsaid that decidedly the most prolific source of ailments of the digestive tract is overfeeding. Farmers who raise their own feed are possibly the worst offenders in this respect, and particularly in the overfeeding of bulky food, or what is called by some roughage. An enormous amount of hay is thus wasted throughout the country, and injury done to many horses. It is really not an exaggeration to state that fully half the amount of hay fed to horses in the rural

districts of this country is wasted. Not only is this so, but a positive injury is inflicted on the horses that consume it. It is, of course, true that horses, for the purposes of perfect digestion, require a certain amount of bulky food. Sufficient nutritious matter can be supplied in concentrated form, but digestion would not go on properly without a certain amount of bulk. Volume of feed is essential to insure the proper activity of the digestive tract.

There is a limit, however, to the bulk required, and if this limit is much exceeded, there is not only a waste of food, but injury is done. If a horse is constantly being fed too large a volume of feed, it overworks and overtaxes the digestive organs, soon weakening these organs and consequently rendering them more liable to indigestion, colic, stoppage and diarrhœa. Even if no such evidence of acute disorder shows itself, as the affections named, the unnecessarily distended bowels encroach upon the chest capacity and interfere with the action of the lungs; so that the horse cannot stand as much exertion as he might otherwise. One likes to see a horse with a good depth of rib, and well ribbed-up and not presenting a tucked-up condition, all of which is evidence of a good feeder. But no horse, unless it is a mare in foal, or one running at grass, should show what is called a "pot-belly," as that

is a sign that too much bulky food is being consumed. Too much bulky food is also a cause of that very serious trouble, called heaves, especially if the food happens to be of defective quality, and consequently difficult of digestion. One often hears it said that clover hay is apt to cause heaves. The reason is that horses are very fond of it, and if they are allowed all they want, will eat an excessive quantity of it. If the quality of clover hay is good, and only a proper ration of it is fed, it is no more likely to cause heaves than any other kind of hay.

Fully one-half the horses one sees in country districts are pot-bellied, especially in the winter. In many farm stables you see racks kept full of hay constantly in front of the horses, and the less work they do the more hay they eat, most of them eating certainly twice as much as is good for them. In cities it is different. Hay being high-priced, the quantity fed is usually limited, with the result that digestive troubles are very much rarer than in country districts. It is directly the opposite with regard to the diseases of the breathing organs. In the large, crowded stables of the cities, with breathing space limited, the air becomes charged with impurities, with the result that diseases of the breathing organs are very prevalent, while in the country they are comparatively rare. The relative prevalence of digestive

and respiratory troubles in city and country affords a good illustration of cause and effect, but the country horse owner has the advantage, as he has to encounter chiefly diseases that are largely preventable. It is a difficult matter to successfully cope with the prevention of respiratory ailments in cities.

It has been already stated and emphasized that the feeding of too much bulky food to horses is one of the most prolific causes of digestive disorders. The question naturally follows: How much is sufficient for a horse to attain the best results? As far as the supply of nourishment is concerned, it can be supplied amply in concentrated form, as in oats or corn; but a certain amount of bulk is necessary. If there is not a certain amount of bulk in the food material in the bowels, the coats of these organs have not sufficient contents to contract on, so that these organs may be able to move along in proper time substances that should be excreted. The bowels become torpid, as far as excretion is concerned, and the proper digestion and absorption of nutritive material is not carried on. Under these circumstances, health and condition cannot be long maintained, and there will be a waste of food fed in concentrated form. Of course, the amount of bulky food necessary varies according to the size of the horse, and it is approximate-

ly correct to put it at about one pound per hundred-weight of the animal's weight. This may be exceeded in some cases with impunity, to the extent of a few pounds, particularly in horses used for slow work; but it will be found sufficient in the majority of cases. While horses are being used for very fast work, or are in training, a less quantity will suffice. The usual plan in large cities is to feed the allowance of hay all at one time, in the evening, after the horse has finished his day's work, and it works very well. People used to seeing a horse get all the hay he can eat, think, when they see him restricted, that he is being starved, but they will find he thrives if adequately fed with grain, has better wind, more endurance, particularly for fast work, and is much less liable to digestive ills.

THE CAUSES OF DIGESTIVE DISORDERS—II

EXPERIENCE proves that there is no better concentrated food for a horse for good hard work than oats. This can be readily explained. First of all, it contains the essential flesh-forming, fat and heat-producing elements in approximately their proper ratio. It also supplies to the nervous system, as no other grain appears to do to the same degree, the sustenance that gives life and ambition. In addition to this, oats have a physical property that mechanically fits them for ready digestion in a greater degree than any other grain. This is due to the fact that the particles of the meal are more loosely put together than in any other grain and that the hull is coarser. On this account, when a masticated mass of oats enters the stomach, owing to its looseness it is readily permeated by the digestive fluid, so that digestion goes on readily and thoroughly. Possibly the most indigestible of all grains, when fed by itself, either ground or whole, is wheat, and this is due to its physical character.

A mass of wheat forms a tough, glue-like lump in the stomach, so that it is comparatively impervious to the action of the digestive fluid, and digestion goes on slowly and imperfectly, and is apt to be arrested, causing serious indigestion. Peas and beans, owing to their flinty nature, are also less digestible than oats. Corn, when fed whole, is fairly easily digested, but when ground is difficult of digestion, unless the cobs are also ground with it, which renders it more pervious. Wheat, corn, pea and bean meal can be rendered much more digestible by being fed thoroughly mixed with a little chaffed hay. The chaffed hay, when consumed with the meal, renders the meal more pervious to the action of the digestive fluid and consequently more digestible. Where, from economy or convenience, it is found desirable to use any of these grains for horses, it can be done with comparative safety, if they are ground and fed with chaffed hay. When meal is fed with chaff in this way, it is generally quite thoroughly moistened, which is a mistake, as in this condition it is apt to be too hastily eaten and too imperfectly mixed with saliva to be thoroughly digested. One reason given for moistening is that it makes the meal stick to the chaff and insures the two being consumed together. There is something in this, but, as a rule, if they are thoroughly mixed, there will be enough of the chaff consumed

to insure the digestibility of the meal. If moistening is done at all, it should be done only slightly. A horse is so constituted that the major portion of his feed should be fed to him dry, as in this condition he will digest it more thoroughly and with less liability to digestive troubles.

Of course, a certain amount of laxative food is necessary in order to mildly stimulate the bowels and keep them sufficiently active. Some horses cannot stand laxative food without their bowels becoming unduly relaxed. To such it is better not to give any, particularly if they are going to work the next day. It is an interesting point to study, and one that throws some light on the peculiarities of the digestive tract, to explain why bran mash, boiled feed and roots act as laxatives. They do not possess any purgative principle, as aloes does. If a dose of aloes is given to a horse, it is dissolved in the stomach, taken up by the blood vessels, going the round of the circulation, and is eventually eliminated by the glands of the bowels, increasing their secretion very much and rousing the action of the coats of the bowels, so that a large quantity of liquid excrement is passed. An explanation sometimes given of the laxative action of mash and the like, is that it is due to the increased amount of liquid supplied by the moist food; but that is not a satisfactory explanation, as there is not enough of it to make

any difference. The most reasonable explanation appears to be that it acts as a laxative by virtue of its indigestibility. It apparently acts in the way that oil does. Small quantities, as a couple of ounces, of linseed oil, given three times a day to a horse, are digested and cause the animal to accumulate fat; but if a pint or a pint and a half is given, it will not be digested, but passes on into the bowels and stimulates them, causing laxative action. It will be noticed that it is the undigested portion of the oil that causes the purging. So it is with boiled feed and mash. It is on account of a considerable quantity not being digested, that passes into the bowels and stimulates their action. This is beneficial up to a certain point, but if the bowels are overstimulated, irritation is apt to result and the system is robbed of some nutrition. Horses that are not worked or worked very little, can stand, and, in fact, require more laxative food than those more exerted. Active exertion of itself has a naturally stimulating effect upon the bowels.

The lesson we learn from all this, is that moist food for horses should be given with care and judgment. Given too frequently or in too large quantities at a time, it is apt to cause indigestion and undue relaxation of the bowels. Most horses that are doing little work, such as those in moderate exercise, are benefited by a little boiled

oats and barley, given every evening. This is a very good plan, particularly for sale horses. It is a good rule to follow with hard-worked horses, that if they happen to stand in for a day, a mash should be substituted for their evening meal of grain. With horses that work hard and regularly six days in the week, the general custom of giving the mash on Saturday evening is a good one; but in the case of horses that may be left in for the day at irregular intervals, it is usually the best plan to give simply a mash for the evening meal instead of grain.

Veterinarians meet with a frequently fatal disease called by them azoturia, which in almost all cases is a preventable disease, due to an error in feeding. It usually occurs in horses used to regular work and good feed being kept idle for a few days and getting as much feed as when they are working. It has been found in large stables that with the carrying out of the rule that if a horse does not go out during the day he shall have no grain in the evening, but only a mash, there will be very few, if any, of these cases.

Indiscretion in watering horses sometimes leads to derangement of the digestive organs. The chief trouble arises from allowing too long intervals to elapse in watering. Under normal conditions water may be given as often as it will be taken, and it is rare that a horse will take too

much, unless he is very warm. Even when he is quite warm, a quart or two may be given with impunity. The proper plan is to water before feeding, as the water is then rapidly absorbed and does not interfere with digestion. Unfortunately, it is difficult to get many horses to drink, particularly in cool weather, before feeding, and they have to be watered afterwards; it is, however, wise to allow an hour to elapse before doing so. If a horse takes a full feed of grain and a drink shortly afterwards and is then put to any violent exertion, he is very apt to suffer from digestive derangement. If a horse is suffering from diarrhœa, or is purging from a dose of physic, water must be restricted and slightly chilled; otherwise, superpurgation and death may result.

An irrational plan of salting horses sometimes causes trouble. That horses require salt is generally recognized, but a great many follow the plan of giving it at intervals of a week or more, when they become very ravenous for it and eat a great deal of it, which makes them so thirsty that they will drink immoderately, and this will sometimes cause digestive derangement. Horses should have access to salt constantly; they then get the most benefit from it.

Before leaving the subject of feeding, it should have been stated that care should be taken in

making changes of diet, which should not be done too abruptly, particularly changes to food which, if eaten hurriedly or in considerable quantities, is apt to cause indigestion. Good examples of such food are roots, boiled grain and grass. An attack of indigestion in a horse that is a good feeder may almost certainly be caused by giving too large a feed of roots or boiled grain or by turning him into a fresh clover field that has a luxurious growth of herbage. If the grass is short, and he has to work hard for his feed, he can be safely turned into a pasture field; but where there is luxuriant growth, there should be several days' restricted feeding before it is safe to allow some horses, particularly greedy feeders, liberty to eat at will.

In all horses in which the excrement from the bowels shows evidence of imperfect mastication, the cause should be sought for, and removed if possible. Greedy feeders bolt their grain, not taking time for perfect mastication. This not only results in waste, but is apt to cause irritation also. Bolting the grain may be prevented in a variety of ways. Numbers of feed boxes have been invented to overcome this trouble, some of which are fairly effectual. The old-fashioned plan of putting a number of stones amongst the grain works very well. The addition of an equal quantity of bran to the grain is also an

assistance, but really the most effectual plan, where practicable, is to mix two or three pounds of chaffed hay with the grain. In the case of horses which do not bolt their grain, where there is evidence of imperfect mastication, the grinders should be thoroughly examined. This should be done by a qualified and reputable veterinarian. The wandering, self-styled horse dentist should be carefully avoided, as he is apt to injure the teeth by the over-use of the forceps and tooth-rasp. Many horses' lives are shortened by allowing unprincipled and ignorant men to ill-treat the teeth.

Horses are more liable than almost any other species, to irregular growths of the grinders, owing to their peculiar anatomical arrangement. The two rows of grinders in the upper jaw are further apart than those in the lower, and consequently overlap them on either side. The grinding surface is beveled, and in the upper jaw slants from within outwards, forming a ridge on the outside of each row. The arrangement in the lower jaw is just the opposite, the ridge coming on the inside. In order that grinding of the food may take place in a perfect manner, the teeth must come into perfect apposition. If the grinders do not come into perfect contact in the process of grinding, the food is not only imperfectly masticated, but the teeth wear irregularly.

Nature's method of keeping the teeth of normal dimensions is by the wear they experience during grinding. If from any cause this wear does not take place throughout all the grinding surface, irregular projections form, and are most apt to be found on the outer ridge of the upper rows of grinders and on the inner of the lower ones. These projections are liable to interfere with mastication to a degree proportionate to their size, and sometimes cut and abrade the cheeks and tongue. When the mouth is in such a condition, it will be much benefited by proper attention. The owner, however, should not be misled by traveling dentists into thinking that all horses' teeth require attention. The dentist points out the projecting ridges on the outside of the upper rows and on the inside of the lower ones, and makes the owner believe this to be an abnormal condition. Some owners seem to think, or are made to think, that the grinding surfaces should be level from side to side, instead of beveled, as nature made them.

In addition to the tendency to injurious projections on the grinders, as already described, we not infrequently find on the front part of the first upper grinders and on the back part of the last lower ones, prominences of considerable size. These are found generally in horses with "parrot mouths," or what are sometimes called "overshot

mouths." This is a deformity, as the upper jaw is placed a little too far forward with respect to the lower one, so that a portion of the first upper grinders and of the last lower ones do not come in contact with opposing teeth. These are not kept of normal dimensions by wear; consequently, projections are formed, which seriously interfere with mastication, and otherwise injure the mouth. Occasionally a broken or decayed tooth is found, which also gravely interferes with the grinding of the food. If from any cause the power of mastication is impaired, it results not only in waste, but the imperfectly prepared food is liable to cause digestive derangement. If a horse is found to slobber at the mouth and to have difficulty in eating, the teeth should always be carefully examined by an expert.

THE USE OF BURRS ON HORSES' BITS

EVERY now and then one hears of the A. S. P. C. A. making a crusade against the use of burrs on horses' bits, and it is one of the practices that their agents are always on the alert to detect. They assume that the use of a burr is such a very evident act of cruelty, that they would have no difficulty in securing a conviction, which would redound to their credit as assiduous and vigilant officials.

Owners of horses appear to be afraid to take a chance of defending such a suit. Why? Is it because they are averse to spending the time, experiencing the incidental worry, and standing the expense, or is it the fear of being convicted of cruelty to an animal? It seems to the writer that the latter is the chief reason, and from which one would naturally shrink; otherwise it appears difficult to understand why horsemen allow men who, as a rule, have very limited or no knowledge of horse management, to dictate to them as to what equipment they should use in driving their horses.

To one who knows the use of a burr, it seems incredible to think that, with a fair trial and a proper presentation of a defense, a conviction could be obtained against a driver of a horse for using a burr on a properly selected subject.

Numberless experts could be obtained as witnesses to show that the use of a burr is no cruelty in properly selected cases, and such experts could be obtained amongst horsemen of undoubted standing who would shrink from anything that savored of cruelty to animals.

Still further, it could be demonstrated, as it has been to the writer many times, that it is positively inhumane not to use a burr on some horses. One comes in contact with nervous, fretful pullers, that wear themselves out, lose their appetites, and become wrecks, that by the use of a burr often cease pulling, in a large measure, drive comfortably, and regain condition. People are heard to speak of burrs as if they are instruments of torture, placed on a horse's bit to irritate him. Some suppose that they are used to give a horse a stylish carriage and promote action. As there is so much misconception with regard to the object of their use, it will be well to explain what is intended to be accomplished by them.

A burr is made of a piece of thick leather, studded with bristles on one side, about half an

inch long. It has a hole in the centre, so that it can be fitted on the mouth-piece of the bit, and a slit running from the circumference to this hole, so that it can be taken off or put on, as occasion requires.

When it is put on it is placed on one end of the mouth-piece of the bit, right up against the cheek-piece of it, with the bristled surface towards the horse's mouth. If the mouth-piece of the bit is of proper width, the bristles do not prick the skin of the horse's lips, unless he voluntarily presses on them. After he has pressed on them a few times, finding they are uncomfortable, he usually stops doing it; then they don't hurt him.

This is the object of a burr, namely, to keep a horse from pressing on one side of the bit. A horse that presses forcibly on one side of the bit, which habit is usually called side-lining, is very difficult to guide, as he takes an unyielding grip of the bit, usually holds his head to one side, and pulls to an extent most uncomfortable to his driver, and most wearing to himself. Anxious, ambitious, free, high-strung horses are apt to get into this habit, unless their mouths are properly educated to the bit, and their general handling and management good.

Not the least important amongst the exciting causes is insufficient and irregular work, causing a horse to get what is often called "above him-

self." Under such circumstances, if he is a free horse, he will go up firmly against the bit, and may bruise or injure his mouth in some way, producing soreness and irritability of the gums where the bit presses. This causes him to pull more, and some horses brace themselves against the cheek-piece of the bit, which enables them to pull to an extent most trying to the driver, and most wearing to themselves. The farther they go the more they pull and the more excited, fretful and heated they become. The constant repetition of this causes them to get "run down" in condition, and the unnecessarily violent exertion they make in performing their work is very hard on their legs and feet.

If by the simple expedient of using a burr on a puller's bit, this habit of pulling can be lessened, and practically overcome in some cases, is it not justifiable to take the risk of subjecting a horse's lips to a few pricks with bristles in order to attain such desirable results? A fretful puller suffers infinitely more, by the over-exertion to which he subjects himself, and by working himself up into an excited and heated state, than by the use of burrs.

As for the driver, it becomes absolutely painful to him to drive a side-lining puller, and it is not without danger, especially where there is crowded traffic, as in cities, on account of the dif-

ficulty of guiding and controlling a horse with such a disagreeable fault. To a driver who has had his arms pulled out, the use of a burr does not seem by any means too drastic a remedy.

It may be asked: Is there not some other means of a less heroic nature, that may be resorted to, to overcome this disagreeable habit? There is no doubt that thoughtless, careless, ignorant and unintelligent handling and management of horses, especially of young ones, makes many pullers. Sensitive, nervous, courageous horses are predisposed to this fault, and there are some in which it is almost impossible to prevent the development of it.

Some horses, whose mouths have become irritable from pulling, will be very much benefited by "turning out" for two or three months. Keeping the bit out of the mouth for a length of time allows that organ to heal and freshen up, until it may regain something like its normal condition; but much care must be exercised when they are again put to work, otherwise they will soon relapse into their former habit of pulling. No matter how much care is exercised with some horses, that may almost be called natural pullers, they will develop the fault, and any measures adopted to overcome it are fruitless, and all that can be done is to seek measures of control, such as proper bitting and the use of burrs. Many pull-

ers are quite valuable horses, and their owners are loth to lose their service, or even to part with them for a good price, on account of the good qualities they possess.

The use of burrs, like everything else in the management and control of horses, should be done with discretion. Bits and bearing reins can be made instruments of torture, just as much and more than burrs, if not intelligently used. The apparently simple matter of placing the bit in the proper position in a horse's mouth is one subject to great abuse, and is the cause of much suffering. It is no exaggeration to state that fully one-third of the horses one sees on the streets in New York City have not got their bits in the proper position in their mouths. How frequently one sees horses with their mouths partly open, tongues dry and projecting more or less from their mouths, due entirely to bits being placed too high in them. Much of the pulling is due to this error in bitting, as is also the unsightly fault of tongue-lolling.

No practical person advocates not using bits, although on account of the ignorance and lack of intelligence and skill in the manner in which they are used, they are the cause of more suffering than all other causes combined.

There are some pullers that burrs do not benefit much, and they are sometimes used on horses

unnecessarily. They are occasionally used on horses that do not pull, but have acquired the habit of pulling out in double harness. A much more rational and effectual way of overcoming this fault is to drive the horse on the other side.